PHASE 2 REPORT - REVIEW COPY
FURTHER SITE CHARACTERIZATION AND ANALYSIS
DATABASE REPORT
HUDSON RIVER PCBs REASSESSMENT RI/FS

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Region II

ALTERNATIVE REMEDIAL CONTRACTING STRATEGY (ARCS)
FOR
HAZARDOUS WASTE REMEDIAL SERVICES

EPA Contract No. 68-S9-2001

VOLUME 2A

TAMS CONSULTANTS, Inc.

and

Gradient *Corporation*

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EXECUTIVE SUMMARY

The Phase 2 Database Report describes the organization of the data collected for the Hudson River PCBs Reassessment including both historical data, Phase 2 project data and recent data collected by others. This Database Report is Volume 2A and addresses only the Hudson River Reassessment database, its structure, and use. There are five additional reports (Volumes 2B through 2F) which will be issued in Phase 2.

The report contains two main sections, specifically:

- **Database Overview** section which defines the database elements, explains the sources of data, describes the organization of the data within the database itself, and discusses the contents of each of the seven major database directories and their subdirectories.

- **Database User's Guide** section which explains in considerable detail what specific data are located in which directory, subdirectory or table and provides (using examples from the actual database) practical examples of common queries and applications.

Approximately 750,000 records reside in this Reassessment database. The database is organized into over 100 database tables and spreadsheets. The entire data set is available from USEPA in DOS-compatible format on CD-ROM, a "read-only" (*i.e.*, the data can only be viewed) compact disk which looks exactly like an ordinary audio CD but is formatted for use by computer according to standards for computer data organization. The database on CD-ROM will be in two database formats, Paradox™4.0 and FoxPro™/DBase III™.

The database is a combination of historical data collected prior to this Reassessment and field data gathered during Phase 2 of the Reassessment, from sampling programs conducted by USEPA and from complementary programs performed by other investigators (*e.g.*, GE, NOAA, etc.) which are relevant to this project. There are seven major directories in the database: *HISTORIC, LDEO, USGS, GE, NYSDOT, PHASE 2* and *NOAA.* Each of these main directories are described more fully in the Report. Figure ES-1 represents an overview schematic of the Reassessment database structure showing the major directories and subdirectories and a general description of the directory contents.

The database created for the Reassessment provides the foundation for all studies to be performed by the USEPA for the Reassessment RI/FS.

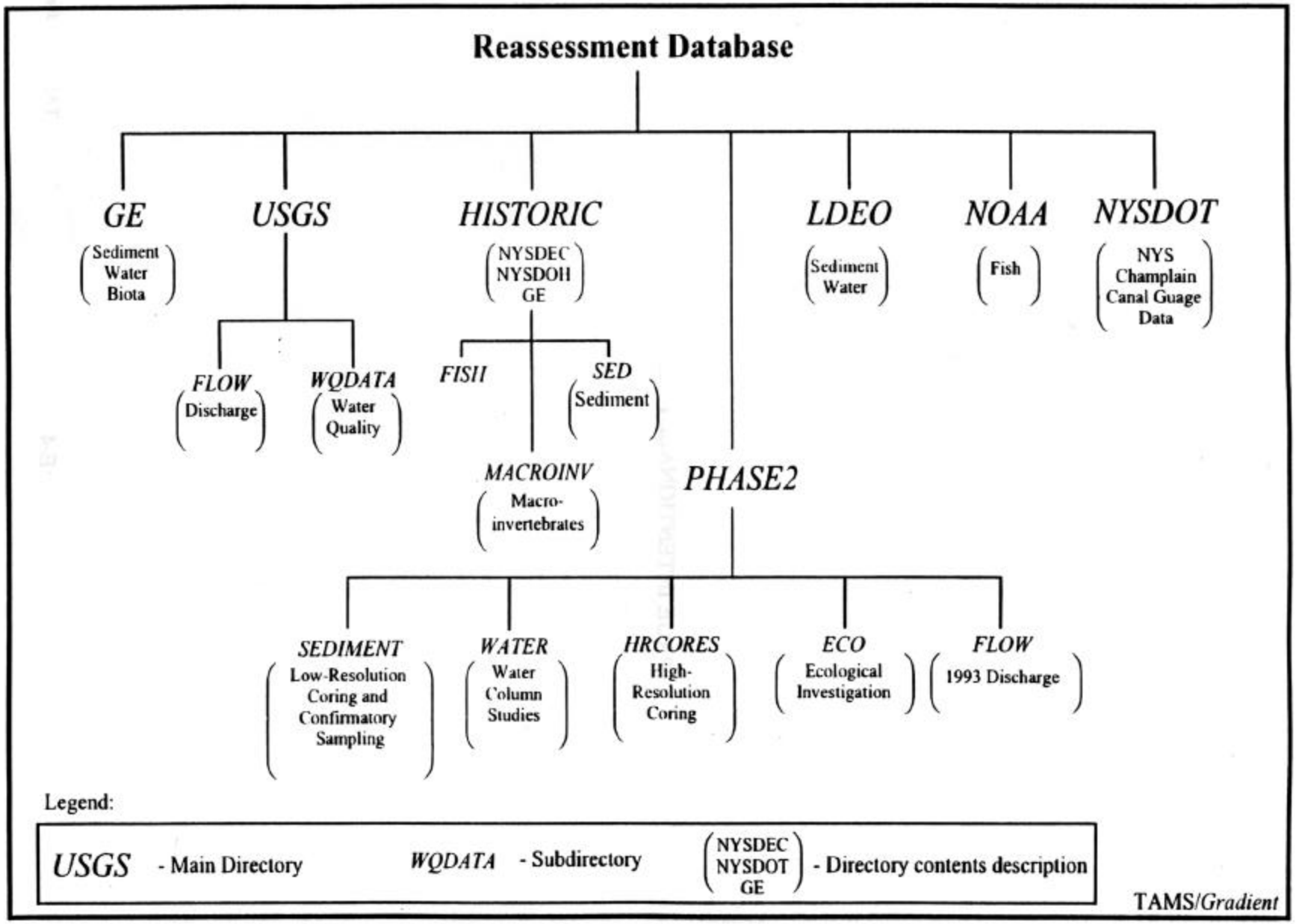

Figure ES-1

Descriptive Diagram of the Hudson River PCB Reassessment Database

1. INTRODUCTION

This document provides a description and guide to the extensive database created for the Hudson River PCBs Reassessment Remedial Investigation/Feasibility Study (RI/FS). The database contains information obtained from a variety of sources: New York State Department of Environmental Conservation (NYSDEC), New York State Department of Health (NYSDOH), New York State Department of Transportation (NYSDOT), General Electric Company (GE), the Lamont-Doherty Earth Observatory (LDEO), the United States Geological Survey (USGS), the National Oceanic and Atmospheric Administration (NOAA), as well as the United States Environmental Protection Agency (USEPA).

In December 1990 USEPA issued a Scope of Work for reassessing the 1984 No Action decision for the Hudson River PCB site which identified the three phases as follows:

- Phase 1 - Interim Characterization and Evaluation
- Phase 2 - Further Site Characterization and Analysis
- Phase 3 - Feasibility Study

The Phase 1 Report is Volume 1 of the Reassessment documentation and was issued by USEPA in August 1991. It contains a compendium of background material, discussion of findings where findings could be made and preliminary assessment of risks. The TAMS/Gradient team compiled a database of historical data to complete the Phase 1 work. The database issued with this report represents an expansion of the previous compilation due to a plethora of new data collected or researched since the earlier work was performed. This database provides the most comprehensive data set available to date for investigating PCBs in the Hudson River.

This Database Report is Volume 2A of the Reassessment documentation and is one of a series of reports in Phase 2. Companion Phase 2 documents are planned to include the Preliminary Model Calibration Report (PCB fate and transport modeling), the Data Evaluation and Interpretation Report (results of the Phase 2 investigations), Baseline Modeling Report (baseline models used in the ecological and human health risk assessments), the Human Health Risk Assessment Report and the Ecological Risk Assessment Report.

This Database Report includes two chapters following this brief introduction, summarizing the contents of the database and its sources (Chapter 2) and directing the data users through specific example queries and pertinent database details (Chapter 3). To facilitate widespread and relatively easy use of the data set itself, this report contains details of database design including listing of database tables, names and descriptions of fields and relationships between database elements. Additional tables of information are included as glossary tables within the database itself to also assist the user. The data set itself is considered part of this report and is available on CD-ROM in DOS-compatible format from the USEPA.

It should be noted that the inclusion of non-USEPA data in the data set does not constitute any approval, validation or certification of the data by the USEPA. Since these data were not produced specifically for the USEPA, the USEPA cannot be responsible for any errors they contain. Users of the non-USEPA data tables should refer to the original documents containing these data for clarification of data quality and potential uses. In some cases, the user will need to refer to the original documents for specific information concerning sample locations and descriptions. The non-USEPA data provided in the database were reviewed and used as needed in this Reassessment, and are included in the database for completeness.

2. DATABASE OVERVIEW

In simplest terms, a database is an organized collection of information. The classic example of a database is the telephone book which organizes information about people: names, phone numbers, and addresses. A *relational database* arranges distinct categories of information into *tables* where data are accumulated as rows or *records* in columns or *fields*. Relationships or *links* between fields are explicitly defined so that information may be drawn from multiple tables. Data dictionaries defining the names and sizes of table fields are provided for all database tables. The database elements are summarized below.

- **Relational Database**

Collection of computer files that store data in the form of tables

- **Record**

Row in a database table

- **Field**

Column in a database table

- **Links**

Relationships between database tables based on common fields (columns)

- **Data Dictionary**

Table that defines data table fields

- **Data Glossary**

Computer file that contains the definitions of parameters and terms used in the database

TAMS/Gradient has used the relational model in developing the Hudson River database. Because of the quantity of information, the Hudson River database is organized by sampling program and by environmental medium. The database tables are organized into several basic elements, including chemical concentration data, sampling information, and reference information. The basic elements may be composed of many tables that are linked together. The organization provides a means for efficient data management.

The extensive size of the database is dictated by the large number of monitoring efforts which have taken place in the Hudson. During the early 1970s, NYSDEC and several other agencies began the first comprehensive monitoring studies for PCBs in the Upper Hudson. Fish, which were some of the earliest environmental samples analyzed, showed high concentrations of PCBs. These early investigations began over two decades of studies to date on PCBs in water, sediments, fish and other media affected by PCB discharges to the Upper Hudson. Table 2-1

summarizes the major investigations.

Of the many investigations listed in Table 2-1, nearly all are represented in some fashion in the Reassessment database. In general, only those data which were explicitly used in the Reassessment were included in the database. Thus, not every dataset represented in Table 2-1 is included in its entirety in the Reassessment database. Nonetheless, the non-Phase 2 data contained in the database represent more than 400,000 of approximately 750,000 records in the Reassessment database.

Figure 2-1 shows the seven major directories for the Reassessment database. Also shown are the subdirectories for each of the major directories. This figure provides descriptive titles of the directories along with some notation concerning the agency or type of data contained in the directory. For those readers who are unfamiliar with computer terminology, a directory is similar to a filing cabinet. Subdirectories, in turn, are similar to the individual drawers of the cabinet, which contain the individual files (or tables) in the database. The report maintains certain conventions when referring to specific database elements. When a file directory or subdirectory is noted in the text, it is in italics and capital letters, *e.g.*, *HISTORIC\SED*. Database table names are in capital letters and bolded, *e.g.*, **STATIONS**. Database fields are in bold text and written as they appear in the tables, *e.g.*, **Yr** or **Ref**.

Figure 2-2 shows the Reassessment database structure in more detail, providing exact directory and subdirectory names as well as the names of all files contained in the database. Table 2-2 provides a summary of the data sets contained in the database and Table 2-3 describes the contents of the subdirectories for each of the seven major directories.

In the remaining portions of this chapter, the contents of each of the seven major directories along with their subdirectories are described. These descriptions provide the original source of the information contained in the Reassessment database as well as a general description of the data itself, including the number of samples and the types of analyses. These descriptions are not intended to address the quality or interpretation of these data. These discussions will be found in subsequent Phase 2 documents.

2.1 Historical Data

2.1.1 Sediment

This section reports on the data sets contained in the *HISTORIC\SED* subdirectory: the NYSDEC 1976-78 surveys, the 1984 NYSDEC Thompson Island Pool Sampling, and the 1989 and 1990 GE sediment sampling efforts. So that each record is explicitly classified in the database tables, the **Yr** and **Ref** fields identify the year the sample was collected and the data source, respectively. Data sources for the historical sediment component are shown in Table 2-3A. Unless otherwise noted, the data are organized within the main database tables of the *HISTORIC\SED* subdirectory.

1976-78 NYSDEC Sampling

As reported by Tofflemire and Quinn (1979), NYSDEC conducted several sediment sampling surveys in the Hudson River between 1976 and 1978. Details of the sampling and analysis procedures for these studies are summarized in NYSDEC Technical Report No. 56 (Tofflemire and Quinn, 1979).

The data provided to TAMS/Gradient by NYSDEC as printed results represent a total of 1,167 sediment samples, 396 core samples and 771 grab samples, collected during 1976, 1977, and 1978; 1,770 PCB analyses were reported for the 1,167 samples. The overwhelming majority of samples from the 1976-78 data set correspond to locations in the Upper Hudson River, *i.e.*, 1,091 of the 1,167 samples. Of the remaining samples, only five samples in this data set have locations recorded in the Lower Hudson River, and each of these five was from River Mile 153, just south of the Federal Dam at Troy. One anomalous sample was reported for River Mile 105.2; however, its northing value, 1,166,970 feet, corresponds to a location within the Upper Hudson River. A total of 70 samples had no information regarding river mile or northing-easting coordinates, and therefore could not be considered in subsequent data evaluation. Figure 2-4 shows the NYSDEC sampling locations.

TAMS/Gradient encountered some difficulty matching the contents of the database with the data summaries provided in the original data reports. The differences in the overall number of samples is detailed in the Phase 1 Report.

Aroclors 1016, 1221, and 1254 were identified as the PCB mixtures detected in the 1976-78 sediment sampling effort. Analytical quantitation limits were not reported in this data set, and no indication was given regarding whether a sample had detectable or nondetectable concentrations of PCBs. However, several concentrations (1 ppm, 5 ppm, 10 ppm) occur with great frequency, suggesting that these concentrations are probable quantitation limits for these samples.

1984 Thompson Island Pool Sampling

In 1984, NYSDEC undertook an extensive sediment sampling program in the Thompson Island Pool (Brown *et al.*, 1988). The objective of this study was to characterize areas of contaminated sediments that would be removed during the Hudson River PCB Reclamation Demonstration Project, focusing primarily on the 20 *hot spots* previously identified in the Thompson Island Pool and other areas with known or suspected high PCB concentrations.

The investigators identified 1,260 sampling locations in the approximately five-mile reach of the river from Thompson Island Dam north to Rogers Island (See Figure 2-5). Many of these locations were determined by imposing a 125-foot triangular grid on previously defined *hot spots* and on additional areas with isolated PCB concentrations in excess of 50 ppm during the 1983 USEPA survey (NUS, 1984). In addition, sample locations were selected based on known or suspected sediment depositional areas, as indicated by location in the river and bathymetric

measurements. Sample locations in the field were determined electronically using a microwave locating system.

Samples for the NYSDEC survey were collected by Normandeau Associates, Inc. between August 24 and November 30, 1984. In addition, 21 cores were collected from February 1 through 4, 1985; these later samples were collected through ice on the river at locations that had been inaccessible by boat. Table 2-4 provides a description of these data along with a comparison to the results reported by Brown *et al.*, 1988. The database compiled and supplied by NYSDEC to the TAMS/Gradient team contains 2048 records, including duplicate samples and reanalyses. These data represent 408 individual coring sites and 675 grab sample sites (including two sites with no coordinates given). The database includes some 24 co-located resamples representing 23 grabs and one core, with identical site numbers but slightly different location coordinates. The database also contains an additional 35 grab samples and 25 core samples with duplicate analyses. Of the 35 grab samples, 29 appear to be duplicate analyses (*i.e.*, field duplicates with the same date and same location), while 6 pairs, taken on different days, appear to be resamples at an exact duplicate location. All the core duplicate samples represent duplicate analyses. Although this dataset was supplied by NYSDEC, it is somewhat larger than the results reported by Brown *et al.*, 1988. Brown *et al.* reported a total of 407 cores and 607 grab samples in their analyses. The small difference in the total number of cores reported apparently represents rejection of positioning data for one core at station 264. The reason for the larger discrepancy in the number of grab samples reported is unclear.

Samples with field duplicate analyses are labelled with a "D" in the **Dup** field of the **SAMPLES** database table. This "D" indicates that two analyses are available for the particular sample for PCBs and conventional parameters. In the **CONCSED**, **MASSPEC** and **NONCHEM** tables, the **Dup** field is used only to designate the second analysis in a pair of field duplicates. The first analysis in a duplicate pair will have a blank entry in the **Dup** field while the second will have identical **GradNo** and **Section** labels but will be labelled "D1" in the **Dup** field. **CONCSED** contains 53 duplicate pairs for the 1984 data while **NONCHEM** and **MASSPEC** contain 54 duplicate pairs.

As part of the 1984 sediment survey, NYSDOH and Versar, Inc. measured physical and chemical parameters of the sediments collected in this study. NYSDOH determined lengths of cores and sections, percent dry solids, dry specific weight (density), and textures (determined visually). Versar measured percent volatile solids and performed the gas chromatograph analyses for PCBs.

In this investigation, PCB concentrations were screened using gas chromatography with a mass spectrometer (GC/MS) and quantitated by gas chromatography with an electron capture detector (GC/ECD). The GC/MS analyses were used primarily as a screening method to determine which samples would be quantitated using the more accurate (and more expensive) GC/ECD analysis. The GC/MS screening classified samples into one of four categories of total PCB concentrations: less than 10 ppm (<COLD>), 10 to 50 ppm, 50 to 100 ppm, and greater than 100 ppm (*HOT*). Most samples screened into the higher categories were analyzed further using

the GC/ECD method; conversely, many samples that exhibited low PCB concentrations by GC/MS were not quantitated by GC/ECD. Additional information on the screening levels can be found in *HISTORIC\SED***NONDETS** file.

Versar quantitated PCBs as Aroclors 1242, 1254, and 1260 using the method of Webb and McCall (1973). Although the data received from NYSDEC contained a "total PCB" quantification, no mention is made in Brown *et al.* (1988) of the method used to quantify, or calculate, this total. Examination of the data received indicates that the total was not simply the sum of the three Aroclor mixtures quantitated.

The database supplied by NYSDEC contains a total of 926 GC-ECD analyses for PCBs, slightly less than the 954 reported by Brown *et al.* as shown in Table 2-4. The database also contains a record of 1536 samples screened by mass spectrometry. This is greater than the 1125 samples reported by Brown *et al.*, and likely reflects the presence of additional grab samples. A total of 497 samples were reported as analyzed by both GC/ECD and GC/MS and mass spectrometry in the database, matching the number reported by Brown *et al.*

GE 1989 Baseline Studies for the Remnant Deposit Containment Project

As part of the Remnant Deposit Containment Project, General Electric, with USEPA oversight, conducted baseline pre-remediation sediment monitoring (other related monitoring efforts are discussed for the affected media). Sediment samples were collected at five locations in the vicinity of the remnant deposits: one location near Rogers Island; one location far upstream; one location between the remnant deposits and Bakers Falls; and two downstream locations near Lock 6 and Waterford. With the exception of samples from the two downstream locations, PCBs were detected in all samples. The chromatograms were compared against Aroclor mixtures 1221, 1232, 1016, 1242, 1248, 1254, and 1260; Aroclor mixtures detected in the samples were reported to be a construction of Aroclors 1242 and 1254. Because these earlier data were only quantitated on an Aroclor basis and were not validated by GE and its subcontractors, they are considered by GE to be of lower quality than later data. Subsequent GE PCB analyses were validated by GE and also provided more analytical detail including, for example, quantitation of homologue groups. As a result, the 1989 study data were provided separately from other data files by GE. Maintaining this distinction, the 1989 sample records are not contained in the main database tables in the *HISTORIC\SED* subdirectory. Instead, these data reside in a table called **GE89** in the same *HISTORIC\SED* subdirectory.

GE 1990 Sediment Sampling for Bioremediation Investigations

General Electric has been conducting extensive research on biological dechlorination and degradation processes occurring within the river which may have altered the composition of the PCB Aroclor patterns within the sediments. In conjunction with these studies, GE has collected samples from selected areas of the Upper Hudson for more detailed evaluation. General Electric provided USEPA with preliminary results of their sediment sampling activities during a meeting on February 28, 1991, and confirmed by a letter dated March 8, 1991 (Claussen, 1991).

In this effort, Harza Engineering collected 103 cores from 12 *hot spots* during 1990 and reported 275 PCB analyses. From three to eight cores were collected at most locations, with the exception of GE's "H-7" location where 62 cores on a 12-foot by 12-foot grid were collected. Samples were analyzed for PCB homologue groups and for five Aroclors, *i.e.*, 1221, 1242, 1254, 1260, and 1268. These results are included in the sediment portion of the historical database and are identified as being from Harza by the entry in the **Agency** field of the **GRADNUMS** database table.

Lamont-Doherty Geological Observatory Investigation

The Lamont-Doherty Geological Observatory (now called the Lamont-Doherty Earth Observatory, LDEO), under contracts to several agencies, conducted several field surveys of PCB levels in the sediments, suspended matter and water column of the Hudson River over the period 1976 to 1988 (Bopp, 1979; Bopp *et al.*1982; Bopp, 1983; Bopp *et al.*, 1985; Bopp *et al.*, 1988; and Bopp and Simpson, 1989). The Observatory also conducted a study of PCB sediment to water partitioning under a contract with NYSDEC (Warren *et al.*, 1987). The field surveys included collection of dozens of cores covering the Hudson River from above Hudson Falls to the New York City Harbor. Many sections of the cores were analyzed for radionuclides to establish core chronologies as well as for PCB concentrations, with an emphasis on homologue- and congener-specific information. Three cores are included in the Reassessment database under the *LDEO* directory. In addition, the results of the PCB water-to-sediment partitioning study are included as well. These tables are distinctly different from the remainder of the Reassessment database tables. Specifically, these tables exist in Lotus 1-2-3™ format and contain data and descriptive text. These tables, which are not relational databases, are listed on Table 2-3.

Other Sources of Sediment Data Not in the Reassessment Database

In August 1983, USEPA conducted a limited study to collect sediment samples from locations that had been sampled in 1976 to 1978 (NUS, 1984). Over sixty core and grab samples were collected within a nine-mile stretch of the river south of Rogers Island, including the Thompson Island Pool. Forty-two samples were collected from within or on the border of previously determined *hot spots*.

In addition to PCBs in river sediments, other chemicals, particularly heavy metals, were measured during the 1976-78 NYSDEC study (Tofflemire and Quinn, 1979), the 1984 Thompson Island Pool study (Brown *et al*., 1988), and by other investigators. Lead, cadmium, zinc, chromium, mercury, and other metals were measured.

Relatively few sediment samples have been tested for other organic priority pollutants. Four sections of two cores collected in 1983 by Dr. Richard Bopp between River Mile 188.5 and 191.1 were submitted to NYSDOH and analyzed for dioxin and dibenzofurans. Six sediment samples collected in 1987 from three *hot spots* were analyzed for dioxins, dibenzofurans, volatile and semi-volatile organics, and pesticides (Brown *et al*., 1988). With the exception of

dibenzofurans, none of these organic parameters were detected in the 1987 samples.

2.1.2 Fish and Aquatic Biota

The database contains data for approximately 11,000 historical fish samples under the subdirectory *HISTORIC\FISH* for the period 1973 through 1993. These files contain data for both the Hudson River proper and tributaries. These Hudson River proper data can be distinguished from the other data because a river mile identifier has been assigned only to Hudson River samples; this field is blank for samples from tributaries or ocean water beyond the Verrazano-Narrows Bridge. Additional data for other aquatic biota (macroinvertebrate and multiplate data) account for several hundred additional samples. These data are found in the *HISTORIC\MACROINV* subdirectory. NYSDOH monitored multiplate samples and chironomid larvae from 1973 through 1985. A discussion of the specific fish/biota studies from which data have been extracted for the database is provided below. Table 2-3 lists the data sources.

NYSDEC Fish Sampling

Data exist on concentrations of PCBs in Hudson River fish collected by NYSDEC between 1970 and 1993. While over 30 species of fish are represented in the data, 75 percent of the samples are from a half-dozen species including striped bass, largemouth bass, brown bullhead, pumpkinseed, american shad, and american eel. Approximately two-thirds of the samples tested were standard fillet samples, with most of the remainder being whole fish. The type of sample is identified by the **Prep** field for sample preparation in the database. In the database, sampling information identifies the species, sex, age, sample weight and length, whether the samples represent composites or individuals, as well as date and location, *i.e.*, river mile of sample collection, and data source.

Samples Collected Prior to 1975

While polychlorinated biphenyls are known to have been discharged into the Upper Hudson River since the 1940s, no testing for PCBs in fish is known to have been undertaken before 1970. Summary statistics of results for fish samples collected and analyzed for PCBs in the period 1970 through 1974 are reported by Spagnoli and Skinner (1977); however, the complete data set for this period are unavailable. These samples include one smallmouth bass collected at Warrensburg and 146 fish representing 11 species collected below the Troy Dam. In August 1974, a team from USEPA Region II visited the Fort Edward, NY area and obtained water, sediment and fish samples from upstream and downstream of the GE discharge in Fort Edward. Samples collected prior to 1975 can be identified by the entry in the sample year field (**Yr**).

Samples Collected from 1975 to 1976

NYSDEC undertook more detailed monitoring of PCBs in fish from both the Upper and Lower Hudson during 1975 and 1976. A total of 440 Hudson River fish samples were analyzed in this period and results have been provided by NYSDEC. These data have been merged with the

earlier data in the *HISTORIC\FISH* subdirectory.

The 1975 to 1976 fish collections were made by regional NYSDEC Fish and Wildlife personnel who were instructed on specific species and sizes of fish desired, location of stations and time tables for collection. Target species for the Hudson included smallmouth bass, largemouth bass, brown bullhead, goldfish, white sucker, striped bass and various other estuarine species. Other species were occasionally obtained as available. The sample species is identified via the species code in the **Species** field of the database. Attempts were made to sample small, medium (minimum legal) and large representatives of each species.

Samples Collected from 1977 through 1993

By 1979, NYSDEC monitoring methods had been refined and standardized. NYSDEC has provided data covering the period 1977 through 1993 (Sloan, 1994), which include fish and fish composite analyses. Samples were collected on a regular basis, with the intent of sampling selected species at predetermined locations within two-week intervals to minimize potential seasonal effects. Sample collection, preparation, and analytical methods are described in Armstrong and Sloan (1981), Sloan and Horn (1986), and Sloan *et al*. (1988). In 1979, a special project was started to monitor PCB accumulation based on a single year of exposure. For this project, yearling pumpkinseed were selected due to their abundance and non-migratory behavior.

Analyses were conducted by several different state laboratories, apparently using the methodology of Bush and Lo (1973), and reported against standards for Aroclor 1254 and either Aroclor 1242 or 1016. Aroclor 1221 was not analyzed. The nominal quantitation limit of the method was 0.01 ppm, although some of the laboratories reported results only as low as 0.1 ppm. NYSDEC determined total PCBs as the sum of Aroclors 1242, 1016, and 1254 for these data.

NYSDOH Macroinvertebrate Studies

As part of the Hudson River PCB Reclamation Demonstration Project, NYSDOH conducted biomonitoring studies from 1976 through 1985 using caddisfly larvae, multiplate samples, and chironomid larvae (Simpson *et al*., 1986). These studies included long-term biomonitoring efforts over the entire period, as well as two short-term biological uptake studies in July and September of 1985. From 1976 through 1985, artificial substrate samplers (multiplates) were placed at 17 sites along the Hudson River from Hudson Falls to Nyack, New York (Novak *et al*., 1988) (See Figure 2-6). These samples were collected over a period of five weeks occurring during the months of July, August and September and were analyzed for concentrations of Aroclors 1016 and 1254. The resulting PCB concentrations in the multiplate samples represented a composite of concentrations in sediment, algae, plankton, and various macroinvertebrates. Invertebrates collected in the multiplate samplers included the following taxonomic groups: *Chironomidae, Oligochataeta, Trichoptera, Ephemeroptera, Amphipoda,* and *Elimidae*. Chironomid larvae and pupae were the most abundant invertebrate component from Fort Edward to Saugerties, comprising up to 86 percent of the total macroinvertebrate population at Fort Miller and Waterford.

From 1978 through 1985, caddisfly larvae were collected by hand-picking individuals from rocks at five designated sites: Hudson Falls, Fort Edward, Fort Miller, Stillwater, and Waterford. Caddisfly collections were made in June, July, August and September of each year.

Short-term biomonitoring investigations using the chironomid larvae, *Chironomus tentans*, were also performed by NYSDOH during July and September 1985 (Novak *et al.*, 1990). The monitoring method consisted of placing 25 laboratory-reared chironomid larvae in nylon mesh envelopes or packets that were exposed to the water column. Envelopes were placed in groups of ten in steel mesh baskets at the primary collection site and monitored at 0, 1, 2, 4, 8, 12, 24, 48, 72, and 96 hours. Chironomids were placed at four sites, including two at Thompson Island Pool, one at Bakers Falls and one at Fish Creek, and monitored at 96 hours. Packets of chironomids exposed to the sediment at a collection site located on the eastern shore of the Thompson Island Pool were also collected at 96 hours.

The macroinvertebrate data provided in the database were obtained directly from NYSDOH reports. The locations of the samples are defined by a simple code referring to the 17 sites. These sites are defined in the **DOHSITE** data table of the *HISTORIC\MACROINV* subdirectory. The species monitored as part of these studies were identified in the original reports with a simple number code from 1 to 9. No documentation was found to define these codes. These identifier codes are given in the **Species** field of the **SAMPLE** data table. The results of the study which dealt explicitly with caddisfly larvae have an assigned species code value of 20 in the **Species** field.

2.2 USGS Surface Water Flow and Water Quality Data

The U.S. Geological Survey (USGS) has maintained numerous surface water monitoring stations along the Upper Hudson. These stations have been used to monitor flow, suspended sediment, PCBs, and other water quality parameters. The USGS data, obtained from WATSTORE and the Albany USGS office, provide the longest and most comprehensive record of surface water information available for the Upper Hudson. Flow records, suspended sediment data, and total PCB water column monitoring are discussed below. Table 2-3 lists the monitoring programs and the associated subdirectories where these data are contained. In general, the USGS data contained in the Reassessment database were obtained from WATSTORE, the most recent retrieval being August 1995 (WATSTORE, 1995). As of this date, flow data were available up to October 1, 1993 and water quality data up to 1994. The water quality data retrieved from WATSTORE for this database were limited to those parameters important to the characterization of PCB transport. Specifically, this included total suspended solids, total organic carbon and PCBs. No other water quality data were included in the Reassessment database.

2.2.1 USGS Flow Records

The USGS has collected river discharge (flow) and water quality data at various points along the Upper Hudson River as indicated on Figure 2-3. The lengths of record for the daily flow series at individual locations on the Hudson vary widely, but records are extant from 1907 through the present. Water quality records pertaining to PCBs generally begin in the mid-1970s. TAMS/Gradient obtained the USGS records of the monitoring stations located on the Hudson and its major tributaries between Hadley, New York, which is well upstream of Fort Edward, and Green Island, which is below the confluence with the Mohawk River near Albany, for use in this investigation.

The majority of the USGS flow monitoring stations on the Upper Hudson have periods of record beginning in the 1970s, although continuous monitoring is available at Hadley since 1921. Earlier records are available for the Hudson River at Thurman, NY (Station No. 0131800) for 1908 through 1911 and 1919 through 1920, and for the Hudson River at Spier Falls (No. 01326500) for 1912 through 1923.

While the majority of the USGS flow monitoring data was obtained to examine and estimate PCB loading, it was also needed to examine flood frequency in the Upper Hudson. In order to obtain an extended period of record for analysis of flood recurrence in the Upper Hudson, it was necessary to use the data from a station well upstream of Fort Edward, at the confluence of the Hudson and Sacandaga Rivers, near Hadley, as shown on Figure 2-3. The USGS has maintained a monitoring station in this location since July 1921. The Sacandaga River, a major tributary of the Hudson, enters slightly below Hadley. It has been monitored at Stewarts Bridge near the confluence since September 1907. Table 2-5 provides a brief description of the USGS surface water flow monitoring stations that are included in the database, including the period of record.

It is important to note that the quality of the USGS flow monitoring data varies from location to location as well as over time. In particular, ice coverage of the river greatly limits the accuracy of many flow monitoring stations. The users of these data should refer to the USGS Water Resources Bulletin for a description of each station's flow monitoring data quality. Of particular concern to the Phase 2 monitoring program were the USGS flow records for Stillwater and Waterford for 1993. Due to construction at these sites, the regular staff gauge readings were unavailable during the Phase 2 water sampling programs. As a result, the USGS was forced to estimate the readings at these locations. This delayed the release of this information for many months. Because of this delay and the anticipated uncertainty of these data, flows at Stillwater and Waterford were estimated based on NYSDOT Champlain Canal gauges. The calculated results are discussed briefly in Section 2.5.6 and will be presented in detail in a subsequent Phase 2 Report.

2.2.2 USGS Suspended Sediment Data

Several water quality stations were established on the Upper Hudson in 1969 but measurements of suspended sediment in the water column did not commence until 1975. Monitoring has not been continuous nor on a set schedule, and there has been a tendency to focus on spring flood periods, with little data available for the winter months. A list of water quality monitoring stations, including the periods of record in the database, is provided in Table 2-6.

2.2.3 Monitoring of PCBs in the Water Column

Regular monitoring of PCBs in the water column in the Upper Hudson was initiated by the USGS in late 1975 at Waterford, and expanded to other upstream stations in 1977. Most other sampling programs have been of short duration. The USGS data are, thus, the primary source of time-series information indicative of trends in water column PCB concentrations for the Hudson River.

USGS observations of PCB concentrations have been made at the same water quality stations as suspended sediment measurements (See Table 2-6). Data sets of significant size are available for Fort Edward, Schuylerville, Stillwater, and Waterford, with a limited record at Fort Miller. In addition there are data for project background samples collected upstream of Fort Edward at Glens Falls.

Methods of data collection and analysis are summarized in Turk and Troutman (1981), and Schroeder and Barnes (1983a). Analyses for total recoverable PCB concentrations were performed on unfiltered samples, and results therefore include the dissolved as well as the particulate fraction. Dissolved PCB concentrations were determined on samples filtered through 0.45 micron silver oxide filters. However, dissolved concentrations were determined on less than five percent of the samples.

The concentrations reported were not corrected for incomplete extraction. However, Schroeder and Barnes contend that extraction efficiency is greater than 80 percent for Hudson River water because the river is relatively low in suspended sediment and dissolved organic carbon concentrations. Extraction efficiency may be an issue for periods of high suspended sediment load.

Although the USGS laboratory reports a theoretical quantitation limit of 0.01 g/L through 1983, the practical quantitation limit was considered to be 0.1 g/L because of the small size of the water samples (Bopp *et al.*, 1985). Data for this period recorded on the USGS central database, WATSTORE, contain both values entered as 0 and values coded as < 0.10 g/L. Apparently these are both intended to represent non-detects at the 0.1 g/L quantitation level, and the inconsistency is unintentional (Rogers, 1991, personal communication). With water year 1984 the practical quantitation limit was lowered to 0.01 g/L. Nevertheless, the 1984 and 1985 data are reported on WATSTORE *as if* they adhere to the previous quantitation limit of 0.1 g/L. In 1986, the quantitation limit began to be reported as 0.01 g/L in WATSTORE.

2.2.4 Total Organic Carbon (TOC) Data

Some TOC data collected by the USGS have been merged into the database. These data span the period from July 1974 through September 1979 and represent the total organic carbon levels from unfiltered or whole water samples.

2.2.5 Sources of Water Column Data Not Contained in Database

Two water column studies are described below: Waterford Treatment Plant Data and Lamont-Doherty Geological Observatory Study. These data were not provided in an electronic format and were excluded from the database since they were not needed for the quantitative evaluations performed during Phase 2.

Waterford Treatment Plant Data

The City of Waterford, NY operates a water works serving a population of approximately 12,000 persons in the towns of Waterford and Halfmoon and the Village of Waterford. This is the northernmost water treatment facility drawing water from the Hudson downstream of the Fort Edward area. In 1975, when the USGS began collecting PCB data in the river at Waterford, they also began collecting data for raw water input and treated water output at the Waterford treatment plant, in cooperation with the Board of Water Commissioners of the Town of Waterford and the NYSDEC (Schroeder and Barnes, 1983b). The water for the treatment plant is drawn from a location 0.5 km upstream of the U.S. Highway 4 bridge, where Hudson River water samples are taken at Waterford. For this location, data collected in cooperation with the USGS continue through the end of water year 1983. In addition, data collected approximately bimonthly for November 1983 through February 1985 and March 1987 through October 1989 are available from the Waterford Water Works (Metcalf & Eddy, 1990).

Lamont-Doherty Geological Observatory Study of 1983

A detailed study of PCB transport in the Upper Hudson was conducted by personnel of Lamont-Doherty Geological Observatory in 1983 (Bopp *et al*., 1985). This involved an investigation of Spring-Summer 1983 PCB transport in the Upper Hudson, which was a period of relatively high flows. The Lamont-Doherty study included the collection of data not available from USGS sampling. This study included 20 large-volume filter samples of suspended matter, and 15 nine-liter to 20-liter water samples, collected from Troy to Glens Falls. Unlike USGS monitoring, detailed analysis of both the dissolved and suspended matter PCB fractions of these samples was undertaken.

2.3 GE Data

General Electric has conducted numerous environmental monitoring programs in the Hudson River (See Table 2-3 and Figures 2-7 through 2-12). Analytical results for work

completed after 1990 from these programs were assembled and an updated version was transmitted to TAMS/Gradient in August 1995. The discussion below will address only the post-1990 results since the prior work was discussed in Section 2.1.1 of this chapter. The database in the *GE* directory includes analytical results for water, sediment, pore water and biota samples from the following:

- 1991 Sediment Program
- Temporal Water Column Monitoring Program
- Post-Construction Remnant Deposit Monitoring Program
- Baker's Falls Investigation
- Observation of USEPA Sampling Effort
- Channel Characterization
- Biota Survey
- Highflow Sampling Program
- Archived NYSDEC Fish Samples
- Analysis of Aroclor Standards

GE has provided data for over 1,500 water column samples spanning a period from April 1991 to June 1994. The results include measurements of total PCBs, PCB homologue distributions and capillary column peak concentrations, as well as some conventional parameters such as total dissolved solids, total alkalinity, total suspended solids, and water temperature. Data for over 400 sediment samples are reported, although most represent composited samples rather than single sediment cores. In addition to total PCBs, homologue distributions and capillary column peak concentrations, measurements of bulk density, percent moisture, total organic carbon, and total percent solids are reported for core composites. Sediment samples exist for the 1991 Sediment Program and for the 1992 Channel Characterization Program. Results for 86 pore water samples collected during the 1991 Sediment Program are also contained in the database. Finally, the database includes 75 archived NYSDEC fish samples and 18 biota samples (largely fish samples) from the GE 1992 Food Chain Program (O'Brien and Gere Engineers, Inc., 1993).

It should be noted that the GE capillary column peak quantitations are similar to but not identical to the congener-specific analysis used by USEPA/TAMS in the Phase 2 investigations. The GE data, however, are quantitated based on Aroclor standards and not the individual congener standards used in Phase 2. This leads to some differences in PCB quantitation between the two techniques. This issue, as well as others, will be discussed in subsequent Phase 2 reports. A look-up table (designated by its acronym LUT) **PCB_LUT,** is provided in the database which represents a key relating the capillary peak results to their likely congener identities.

2.4 Staffing Gauge Data

Staff gauge readings were obtained from the NYS Department of Transportation relating to staff gauges along the portion of the Champlain Canal lying within the Upper Hudson (NYS Thruway Authority, 1993). The canal is now controlled by the NYS Thruway Authority which is

the current source for these data. These data represent water levels in the Upper Hudson relative to the NYS barge canal datum. These values can be converted to the Nation Geodetic Vertical Datum by adding 1.177 feet to the readings. The staff gauge data can be found in **GAUGES** in the *NYSDOT* directory (See Table 2-3). The data are arranged by date and represent the staff gauge readings from 1977 to 1993. Readings from different staff gauges are included, representing water levels from Fort Edward (Lock 7) to Waterford (Lock 1). Of particular note, staff gauge 118 represents the water level above Lock 6, which corresponds to the southern end of the Thompson Island Pool.

The staff gauge data contained in the database represent the average of two daily readings collected at each gauge as reported by the NYSDOT. The gauges are not recorded consistently during flood and canal off-season periods so the data are generally limited to April through November of each year. These data were obtained to assist in the calculation of Hudson River flow in 1993 as well as for use in sediment transport modeling. The staff gauge data table **GAUGES** contains all available data for the gauges listed for the period 1983 to 1993. Earlier years were added for the purpose of calibrating flows at Schuylerville, a USGS station with a limited dataset, *i.e.*, restricted to the period 1977 to 1979.

2.5 RI/FS Phase 2 Sampling Effort

The results of the analytical program for Phase 2 of the Hudson River PCBs Reassessment RI/FS can be separated into the basic studies conducted by USEPA/TAMS (with one exception, as noted) as described below and summarized in Tables 2-2 and 2-3.

Water Column Study - Investigation of water column PCB levels, transport and sources *via* sequential sampling along transects, collection of flow-averaged composite samples and collection of daily suspended matter samples.

Water Column PCB Equilibration Study - Examination of dissolved phase to suspended matter partitioning of PCB congeners.

Confirmatory Sampling Study - Examination of river sediment for the purposes of interpreting geophysical data.

High-Resolution Sediment Coring Study - Investigation of long-term trends in PCB transport, release and degradation via an examination of the sediment record.

Ecological Program - Investigation of PCB levels and other parameters in Hudson River fish, benthic invertebrates and sediments from 20 sites distributed throughout the Hudson.

Fish Sampling Study (NOAA) - Analysis of supplementary fish samples collected as part of the Ecological Program.

High-Flow Suspended Solids Monitoring Study - Collection of suspended matter samples during the annual spring high flow event in Spring 1994.

Low-Resolution Sediment Coring Program - Investigation of PCB levels in selected *hot spot* areas of the Upper Hudson.

TAMS/Gradient procured the services of a number of laboratories to perform analyses required for the Phase 2 studies. Of the analyses required, only metals are included in the USEPA Contract Laboratory Program (CLP) Routine Analytical Services (RAS) procurement process. For non-routine analyses having standard methodologies, laboratory services were solicited through the USEPA CLP Special Analytical Services (SAS) procurement process. Analyses with non-standard methods or requiring special attention of project investigators were performed by laboratories procured directly by TAMS/Gradient, including those associated with research institutions employed on the project. In some cases, similar analyses were performed by directly-procured and SAS laboratories for comparison purposes, or to serve different sampling events, depending on project needs. The laboratories employed for particular analyses are shown in Table 2-7.

Data from each of the studies have been incorporated into the database. Sediment results from the confirmatory sampling study and the low resolution sediment coring program reside in the *SEDIMENT* subdirectory under *PHASE2*. Sampling results from the water column study, the water column PCB equilibration study and the high flow suspended solids monitoring study are stored in the subdirectory *WATER*. Results of the high-resolution sediment cores are contained in the *HRCORES* subdirectory. Results for the ecological program are in the *ECO* subdirectory under *PHASE2*, and the NOAA results are in the *NOAA* subdirectory.

In the database design, the sample identifier, which uniquely defines each sample, is divided into two database fields, *i.e.*, **TAMS ID** and **TAMS Type**. This identifier contains the basic sample description information and can be used to simplify most database queries. A third field, **Species**, is required to uniquely identify the ecological biota samples as well as the fish samples analyzed by NOAA. The sample naming convention for each process is described below with examples. It is always necessary to use at least two, and sometimes three, fields to extract the desired physical sample measurement to ensure the correct data are related from the various databases. Examples to illustrate this point are given in Chapter 3.

A result that is not detected is always reported with at least a "U" in the data qualifier field for all data. The sample quantitation limit is then reported as the **Value** for a non-detected result. Thus, a user must not simply take the mean or maximum, or perform any other statistics on the concentration in the **Value** field without first testing for the qualifier and assigning a scheme for non-detected concentration values.

Handling of Sample Duplicates

Reported sample duplicates fall into three groups: laboratory splits, field split samples and co-located field samples. In all programs except the ecological investigation, sample duplicates were handled as discussed below. Ecological sample duplicate handling is discussed in Section 2.5.5. For the field co-locate samples, unless one of the results was rejected during data validation, the results are averaged and the means are reported in the database tables in order to obtain the best estimate of the measured properties at the location. Results for field split samples (*i.e.*, two samples taken from a single homogenized sample volume) were not averaged. Instead, the first analysis is kept in the main data table and is labeled "FS1" in the **Split** field, while the second is placed in an analysis duplicate table under the appropriate *QA_QC* subdirectory and is labeled "FS2" in the **Split** field. Laboratory splits yield a measure of analytical precision while field splits and samples which are co-located yield additional information on the local variability of a measured property. Only the first analysis result of a laboratory split series is retained in the main database table and is labeled "LS1" in the **Split** field. The remaining results of a series are stored under the appropriate analysis duplicate table in the *QA_QC* subdirectory and are labeled "LS2", "LS3", etc., depending on how many split analyses were performed. Both field splits and co-located samples are labeled with a "D" in the **TAMS Type** data field. The **Split** field is used to indicate the type of duplicate analysis. For pairs of co-located samples, both original samples have been moved to a separate table and only the mean of the results of the co-located samples is contained in the main database tables. These mean results are labeled with "Avg-FC" in the **Split** field to denote the composite record.

The analytical values from co-located samples were combined for input to the database as follows:

	Combined PCB Results	*Combined Non-PCB Results*
Duplicate detected results	*Mean of results; qualifier left blank.*	*Mean of results; composite qualifier carried over.*
Duplicate non-detected results	*Mean of reported detection limits (quantitation limits); qualifier left as "U."*	*Mean of results; qualifier left as "U."*
Detected and non-detected result pairs	*Mean of detected value and 1/2 quantitation limit for non-detected results (i.e. analyte is considered detected); qualifier left blank.*	*Mean of detected value and 1/2 quantitation limit for non-detected results; detected-value qualifier carried over.*
Detected and rejected result pairs	*Detected value and its qualifier are reported.*	*Detected value and its qualifier are reported.*
Non-detected and rejected result pairs	*Reported detection limit is retained along with "U" qualifier.*	*Reported detection limit is retained along with "U" qualifier.*

Sample Location Data

Sample locations for the Phase 2 investigation fall into two types, surveyed locations and estimated locations. Sampling sites for the confirmatory sampling and low-resolution coring programs were surveyed in place based on on-shore control points. All other coordinate information, including river mile, represent estimated locations derived from USGS quadrangle maps and other sources. Surveyed coordinates are contained in the **Northing** and **Easting** fields while estimated coordinates are contained in the **Est Northing** and **Est Easting** fields. All coordinates are referenced to the NYS plane coordinate system.

PCB Congener Results

PCB congener results are reported for the high-resolution coring, water column transect sampling, flow-averaged water column sampling, ecological sampling and low-resolution coring programs. The PCB congener analysis consisted of 90 congeners whose identity and quantity were established by individual congener standards. These are labeled as "target" congeners. The look-up table **CONG_LUT** under *PHASE2* provides a listing of these congeners. An additional 37 to 50 congener results are reported based on laboratory-determined retention times and congener response factors. For most of these congeners, no congener standards were run at the time of analysis. These congeners are labeled "non-target" in the Phase 2 database.

With regard to Phase 2 PCB congener analysis, the following should be noted. Due to changes in the chromatographic columns used by the contract laboratory for congener analysis during the summer of 1993, congeners BZ#4 and BZ#10 could not be represented in a limited number of samples. This affected three flow-averaged water column sampling events, one water column transect and the sediment analyses performed for the ecological field investigation. In these instances, the analytical result was reported as a coeluting peak "BZ#4 and BZ#10." However, due to the need to resolve and quantitate BZ#4 more accurately, this coeluting peak was split into BZ#4 and BZ#10 based on their known individual analytical response factors and the ratio of their occurrence in the environment. This separation will be discussed in more detail in the data usability section of the Phase 2 Data Evaluation and Interpretation Report.

Sample Grouping

In the creation of the database, samples within various media were grouped by appropriate criteria, generally by geographic area, in order to assess general property characteristics and to establish a treatment procedure for non-detect values. In general, the recommendation put forth under USEPA (USEPA, 1989) for dealing with non-detects was applied to the Reassessment database. For nearly all non-PCB analyses, non-detect values were infrequent and had little effect on the use of the data. For PCB congener data, non-detect results occurred frequently enough that a systematic scheme was required to handle them consistently.

In all PCB congener tables, two fields labeled **Value1** and **Value2** are reported. **Value1** field represents the validated data with non-detect levels as reported by the laboratory and confirmed by validation. The **Value2** field contains the validated congener detections along with a

modified value for the non-detect results. The non-detect results for a given congener were assigned a value of zero when non-detects for that specific congener occurred in more than 15 percent of the samples within a sample group. When nondetects represented less than 15 percent of results for a specific congener in a sample group, the congener was assigned a value of one-half of the detection limit.

Homologue and Aroclor Sums

Using these results, congener sums were created to represent homologue, total PCB and Aroclor concentrations. For these sums, target and non-target congener results were combined as appropriate. However, all sums were created based on the original 90 target congeners plus the 37 non-target congeners common to all analyses. The additional 13 non-target congeners were not included in these sums to maintain consistency across all analyses.

To create homologue sums, each congener record in the database is associated with a homologue group; *e.g.*, BZ#12 is 3,4-dichlorobiphenyl in the dichloro-homologue group. In the case of multiple congeners eluting together, the homologue group assigned is either the predominant or least chlorinated one present, *e.g.*, the coeluting congeners BZ#37 and BZ#59 are in the trichloro-homologue group because BZ#37 is a trichloro-homologue and is the least chlorinated. BZ#59 is a tetrachloro-homologue. The total PCB value represents the sum of the 127 standard PCB congeners. The Aroclor sums represent the sum of only those congeners found in Aroclor standards run as part of the Phase 2 analytical program. Specifically, only those congeners present at 0.1% or more in a given Aroclor mixture are included in the Aroclor sum. For the Aroclor sums where more than one Aroclor is listed (*e.g.* Ar1016-Ar1242), the sum is constructed by adding together all congeners present in either Aroclor standard. This sum avoids any "double counting" since each congener is added to the sum only once regardless of the number of Aroclor mixtures in which it occurs. As noted above, the homologue and Aroclor sums provided in the Phase 2 data tables are based on the 127 standard congeners and are listed below:

Parameter Name	**Description**
Mono	Sum of monochloro-homologue congeners
Di	Sum of dichloro-homologue congeners
Tri	Sum of trichloro-homologue congeners
Tetra	Sum of tetrachloro-homologue congeners
Penta	Sum of pentachloro-homologue congeners
Hexa	Sum of hexachloro-homologue congeners
Hepta	Sum of heptachloro-homologue congeners
Octa	Sum of octachloro-homologue congeners

Parameter Name	Description
Nona	Sum of nonachloro-homologue congeners
Deca	Decachloro-homologue congener
Total PCBs	Sum of all congeners
Aroclor 1016	Congener-based Aroclor 1016
Aroclor 1221	Congener-based Aroclor 1221
Aroclor 1232	Congener-based Aroclor 1232
Aroclor 1242	Congener-based Aroclor 1242
Aroclor 1248	Congener-based Aroclor 1248
Aroclor 1254	Congener-based Aroclor 1254
Aroclor 1260	Congener-based Aroclor 1260
Ar1016-Ar1242	Congener-based composite of Aroclor 1016 and 1242
Ar1221-Ar1232	Congener-based composite of Aroclor 1221 and 1232
Ar1016-Ar1248-Ar1254	Congener-based composite of Aroclor 1016, 1248 and 1254

Similar to the results for the individual congeners, two values are given for the homologue, total PCB and Aroclor sums. These sums are included in the **Value1** and **Value2** fields. The value given for these parameters in the **Value1** field represents the sum of the detected congener concentrations. In creating this sum, non-detect congeners are set equal to zero. Thus the homologue, total PCB and Aroclor sums given in **Value1** cannot be obtained by simply summing the associated congener values listed in the **Value1** field since **Value1** contains both the measured quantities for detected congeners and the quantitation limits for non-detected congeners. The homologue, total PCB and Aroclor sums given in **Value2** represent the sum of detected and non-detected congeners. In this instance, the non-detected congeners have been assigned values based on the rules described previously in the section entitled "Sample Grouping". The summation scheme described above was applied to all PCB congener data tables in the same manner. Thus, all PCB congener tables contain 2 concentration fields, **Value1** and **Value2**, and 21 congener summation results (10 homologues, 10 Aroclors and total PCBs) for each sample analyzed.

2.5.1 Water Column Transect, Flow-Averaged Sampling and Suspended Solids Monitoring Programs

The Phase 2 water column program conducted by TAMS during 1993 was intended to address several issues concerning riverine PCB contamination, including:

- the sources of PCBs to the Upper Hudson, particularly those in the area of the Thompson Island Pool;
- the nature of the PCB mixture as it enters the river, *e.g.*, dissolved phase- or particle phase-dominant;
- seasonal variations in the flux of PCBs in the Upper Hudson;
- the factors influencing PCB transport and water column concentrations, such as seasonal or flow variations;
- seasonal variations in water column conditions;
- suspended matter *versus* dissolved phase distributions of PCB congeners and how closely they approach an equilibrium distribution;
- the use of equilibrium-based assumptions to predict mean PCB transport; and
- the importance of PCB suspended matter to dissolved phase disequilibrium in the Upper Hudson.

This section provides general comments on the water column samples themselves, including naming conventions, handling of sample duplicates and locations of sample stations. A description of each of the sampling programs follows. Figures 2-13A and 2-13B show the water column sampling locations for the Upper Hudson and Lower Hudson, respectively. Figure 2-14 shows the suspended solids monitoring locations.

General Comments

Water column data on PCB levels were collected during two separate sampling programs: the transect sampling program and the flow-averaged sampling program. Samples from the transect program are identified by an initial "T" in the **TAMS ID**, followed by an "S" for suspended matter or a "W" for the filtered water, *i.e.*, dissolved phase sample. Flow-averaged samples are identified by an initial "F," also followed by an "S" or "W" denoting the sample matrix. The middle three digits refer to the transect or flow-averaged sampling event and the last four digits refer to the sampling station. For example, sample name TS-001-0008 represents the suspended matter transect sample from transect 1, station 0008; sample name FW-002-0005 refers to the filtered water sample from flow-averaged event 2 at station 0005.

Daily samples collected during flow-averaged sampling events are denoted by incrementing the middle three digits in the sample identifier, *e.g.*, 101 for day 1 of flow-averaged sampling event 1, 102 for day 2 of flow-averaged sampling event 1, etc. Composited samples of

the first eight days, either mechanical or mathematical, are designated by a "9," *e.g.*, 109 for composited flow-averaged event 1, or 209 for composited flow-averaged event 2. Finally, a "D" or "M" in the **TAMS Type** field for either a transect sample or a flow-averaged sample refers to a duplicate sample or matrix spike sample, respectively. A duplicate sample result is averaged with the primary sample result of the duplicate pair while the matrix spike sample represents a sample taken at double volume to provide enough mass for an additional laboratory quality control analysis.

The results for sampling days 1 through 8 can be used as independent, instantaneous measurements. The measurements for temperature, conductivity, and dissolved oxygen for these days are included in the database table called **NONPCBW**. Water column transect and flow-averaged sampling programs use the same station numbering scheme. The sampling stations and their descriptions and a listing of the water sampling events and their dates are given in Tables 2-8 and 2-9.

In addition to the PCB sampling programs, two studies were conducted to monitor suspended solids in the Upper Hudson during 1993 and 1994. During 1993, suspended solids and weight-loss-on-ignition were determined for samples collected at Waterford (Station 8) five days per week for April through October. Mechanicville (Station 19) and Lock 2 (Station 26) were also sampled during portions of this period. These samples are labeled with an initial "S1" in the **TAMS ID** for suspended solids monitoring study number 1. The middle three digits refer to the julian calendar day and the last four digits refer to the station number. For example, S1-097-0008 represent the sample collected at Waterford on julian day 97 of 1993, *i.e.* April 7, 1993.

A second suspended solids study was conducted during 1994. This study obtained data on total suspended solids, weight-loss-on-ignition and total suspended organic carbon during a one-month period centered on the annual spring high flow event. These samples were intended to provide a detailed data set concerning suspended matter transport. In all, 18 stations were sampled on some or all of 21 different days during this 32-day sampling event. Table 2-8 lists all of the stations occupied as part of the suspended solids monitoring programs. Samples collected during this event are indicated by an initial "S2" in the **TAMS ID** field. The remaining identifier digits are assembled in the same fashion as the "S1" event. For example, "S2-090-0007" represents the sample collected at Stillwater (Station 7) on julian day 90 of 1994, *i.e.*, March 31, 1994.

In addition to the coded sample information contained in the **TAMS ID** field, other sample information is contained in the **TAMS Type** field. Co-located water samples are indicated by a "D" in this field. True water sample splits were not generated due to the difficulties in homogenizing the large volumes of water collected in the water column studies and the concern over loss of PCBs by the homogenization process. Instead, field co-locate samples were collected on an individual basis for each parameter at a given sampling site. That is, if a field co-locate pair was to be collected at a given sampling site, two sample bottle sets were collected for TSS analysis, two sample bottle sets were collected for PCB analysis, two sample bottle sets were collected for DOC analysis, etc. In these pairs, one bottle set would be labelled with a "D" in the

TAMS Type field. Thus, the analytical results for PCBs, TSS, etc., for each sample in a co-locate pair (e.g., all the results with a given **TAMS ID** and with **TAMS Type** equal to "D") do not represent a matched set. Only the average result for a specific analyte for a co-locate sample pair should be used in a global fashion to describe conditions at the time of collection. The individual analyte co-locate pairs provide information on the combined analytical and sampling precision for the given analyte.

All field co-locate samples for the transect and flow-averaged sampling events have been reported in the main analytical data tables (*e.g.* **PCBP, PCBW, NONPCBW)** as the mean value of the co-located sample results in the database, *e.g.*, TS-004-0005 and TS-004-0005-D. The individual original co-locate sample pair results have been removed from the main database and placed in supplementary tables in the *WATER\QA_QC* subdirectory, *i.e.*, **NONPCBWD**, **PCBWD**, **PCBPD**. The reported average result is indicated by the phrase "Avg-FC" in the **Split** field of the analytical data table. In this manner, each individual analyte (*e.g.* BZ#4, TSS) is marked to indicate that the reported value is the average of two field co-locate samples.

Samples collected as matrix spike/matrix spike duplicate samples for laboratory quality assurance are labeled with an "M" in **TAMS Type**. The results reported in the database are of the same quality as unmarked samples and can be used in the same fashion.

Sampling Program Descriptions

Each of the Phase 2 water sampling programs is described briefly below. Discussions on data results and interpretation will be provided in subsequent Phase 2 reports.

Transect Samples

The water column transect samples represent "snapshots" of conditions in the river and provide useful information on the congener pattern distribution and relationships between dissolved and suspended phases. These events consist of samples from 12 to 16 Hudson River proper and tributary stations. Three of the eight transects extend downstream of Federal Dam at Troy to three locations in the Lower Hudson River. Also, PCB flux, or loading, rates can be determined with flow and total suspended solids data.

Flow-Averaged Samples

Flow-averaged samples provide information regarding PCB flux on a whole-water basis by combining the results from the suspended matter and filtered water sample pairs. Flow-averaged samples were collected from only four main stem Hudson River stations.

The flow-averaged samples represent a flow-weighted mean water concentration for a 15-day period. Samples were collected every other day and composited into a single sample. The daily volume collected was determined by the flow at the USGS gauging station at Fort Edward, just above the Thompson Island Pool. By using the compositing technique, the variability inherent

in individual daily samples was minimized and a truer measure of the mean PCB flux on a whole-water basis, *i.e.*, suspended plus dissolved phase, was obtained.

Suspended Solids Monitoring

These samples were collected to monitor and characterize total suspended solids transport in the Upper Hudson. Due to the affinity of PCBs for suspended sediment, accurate estimates of PCB transport are contingent upon accurate suspended solid loads. The high flow suspended solids monitoring event was intended to characterize suspended solids transport during the annual maximum flow condition. These studies are important to the accurate modeling of PCB transport in the Upper Hudson.

Equilibration Study Samples

Equilibration study samples were held for long periods of time prior to filtration to examine the particulate/water PCB distribution. These samples are designated with the letter "E" in the fourth position in the **TAMS ID**. These samples must not be used for any analysis other than the determination of partition coefficients. These samples were collected during two separate sampling events (transects 2 and 6) and therefore represent different water column conditions. Differences between the first equilibration study in February 1993 and the second equilibration study in August 1993 may be attributed to PCB loads, temperature, dissolved organic carbon, or other seasonal variations. These PCB samples reside in the **PCBWE** and **PCBPE** tables for water and particulate (suspended matter) samples respectively, under the *PHASE2\WATER\EQUILIB* subdirectory.

Miscellaneous Samples

Some sampling events deviated from normal length and frequency of sampling collection protocols. These samples can be combined with other water samples after applying the necessary corrections to account for the way in which these samples were collected. Specifically:

- For the first flow-averaged sampling event, two composites were collected at Waterford instead of one. The first, **TAMS Type** = "A1," represents four every-other-day samples collected over the period from April 23 to 30, 1993. The second represents four every-other-day samples collected over the period May 1 to 8, 1993. The results can be combined into a single flow-averaged value on the basis of the sampling day flows for each period. These samples are labeled FS-109-0008-A1 and FW-107-0008-A1 for the first week and FS-109-0008-A2 and FW-109-0008-A2 for the second week. During the first week of the first flow-averaged event, the lock above the Waterford station was opened at irregular and unpredictable intervals. This caused fluctuations in the discharge at Waterford and visibly variable suspended matter loads, which were not detected by the USGS station. During the second eight-day period, the flow appeared to reach a stable level. Approximately 16 liters of water were collected for each composite sample.

- Prior to the beginning of the flow-averaged sampling program, four composite samples were collected at Waterford, representing time-averaged conditions. Each sample consisted of a composite of 20 one-liter samples collected daily, Monday through Friday, for a one-month period at Waterford. The composite samples were filtered to obtain dissolved phase and suspended matter fractions, as were other water samples, but the composite samples were outside of standard holding times. These suspended matter and dissolved phase PCB results were recombined to generate a single whole water result for the sample. These samples are labeled as FC-709-0008-C1 to FC-709-0008-C3, representing three one-month composites. Note that no corresponding total suspended solids (TSS) data are available for these samples. It is important to note that these samples represent the only temporally-composited samples in the Phase 2 data set and care must be taken to use them correctly. Because they are distinctly different from other Phase 2 results, these samples are placed in their own table, **PCBFA7,** and have a unique matrix name "wat/fil", indicating that they represent the combined water and filter result.

- Roughly two weeks after the main transect sampling event in April 1993, three additional samples were collected at three sampling stations: Fort Edward, Thompson Island Dam, and Waterford. These samples were not collected in a timed fashion, as were done with the other transect sampling events. These samples are labeled TS-008-0004, TS-008-0005, TS-008-0008, and TW-008-0004, TW-008-0005, TW-008-0008 for the suspended matter and dissolved phase fractions, respectively. The TSS data for these samples was collected as part of the on-going flow-averaged sampling so there are no TS-008 specific TSS samples. The correct TSS values can be obtained by matching the dates of these samples with those of flow-averaged event number 1.

- An additional set of one-liter water samples collected in the first water column transect are labeled with "TT" in the first two letters of the **TAMS ID**. These samples were not filtered and hence represent a whole water analysis, *i.e.*, a combination of suspended matter and dissolved phase fractions. As they are not comparable to the other filtered water samples, they have been moved to a separate table called **PCBTT**. Due to the inherent uncertainty in the PCB analysis resulting from their smaller size, these samples were not used in the Phase 2 data evaluation.

Finally, it is important to note that:

- The samples collected at Saratoga Springs (station 0009) are equivalent to field blanks and should not be used in any data analysis because it was taken as a background sample.

Conventional Parameters

Results of the weight-loss-on-ignition (WLOI) analysis, a measure of organic matter content, are reported by RPI for nearly all water column study samples for two temperatures, 375 C and 450 C. The historical database for the Hudson River reports WLOI at 375 C. For comparability to existing data, the value at 375 C should be used. These data are available for all transects except the first, and all flow-averaged events. Total suspended sediment (TSS) and dissolved organic carbon (DOC) data, along with WLOI, are provided in the database table **NONPCBW** with duplicate pairs stored in *QA-QC* **NONPCBWD**. The TSS, chlorophyll-*a*, and DOC data provided by the USEPA SAS laboratory did not meet data quality objectives and have not been included in the database. Chlorophyll-*a* data reported by an alternate laboratory for water column transect samples met data quality objectives and are included in the database.

PCB Congeners

Water samples collected under the Phase 2 program have been filtered into two fractions for PCB analysis, a suspended matter fraction as well as a dissolved phase fraction representing both truly dissolved and dissolved organic carbon-bound PCBs. PCB congener data reside in two main database tables: **PCBP** for the suspended matter (particulate) fraction and **PCBW** for the dissolved phase (filtered water) fraction. In order to construct whole water column inventories, the results reported for both fractions must be summed. The suspended matter results are reported on a mass-per-unit-mass basis, g/kg, and must be multiplied by the corresponding TSS value for the sample in mg/L (x 1 kg/1000 mg) in order to calculate the suspended matter PCB concentration on a volume basis in ng/L. It should be noted that the congener data contained in the **PCBP** database does not represent the actual reported values. The original values for filtered samples were reported in ng/filter. These values were converted to g/kg by dividing by the sample volume (given in **VOLUMES**) and the suspended matter concentration (given in **NONPCBW**). The formula is as follows:

$$\underset{Conc}{Suspended\ Matter}\left(\frac{mg}{Kg}\right) = \underset{Conc}{Reported}\left(\frac{ng}{filter}\right) x \frac{1\ filter}{Sample\ Volume(L)} x \frac{1}{\underset{Solids}{Total\ Suspended}\left(\frac{mg}{L}\right)} x \frac{10^6\ mg}{Kg} x \frac{mg}{10^3\ ng}$$

Generally speaking, water samples should be grouped for analysis according to the region of the river from which they are derived. The sample groups for analyzing water column PCB distributions for both transect and flow-averaged samples are shown below.

Water Column and Flow-Averaged Sample Groups for Determining Frequency of Non-Detected PCB Congeners

Group	Station Number [1]	River Mile Range
Upper River	3, 4, 5, 6, 7, 8, 19	195.8 to 156.6
Lower River Freshwater [2]	14, 15, 16, 17	153 to 77
Lower River Saline	none	
Background & Tributaries [3,4]	1, 2, 11, 12, 13	
Lock 7 [5]	10	potential source

[1] Station 9 (Saratoga Springs) was used to assess sampling and laboratory contamination and should not be used in any sample grouping.

[2] Station 0014 (Troy at Green Island Bridge) was monitored to represent the mixture of the Mohawk (0013) and Waterford (0008). These Lower Hudson stations were monitored during three of the eight water column transects.

[3] Quantitation of contaminants in these samples is questionable because the levels approach the detection limit. While there are sources of PCBs in the river upstream of Fenimore Bridge, these samples represent applicable background conditions for the river downstream of that point.

[4] These stations represent three different watersheds and should generally be considered separately.

[5] The Champlain Canal above Lock 7 represents a potential source to the river, but flow rates through the lock are negligible; therefore fluxes are expected to be small or negligible.

2.5.2 Confirmatory Sampling Study

Confirmatory sampling results are intended for use with the geophysical investigation of the Upper Hudson, specifically the side-scan sonar survey. Since the geophysical techniques recorded physical river bottom properties, specifically reflectivity, there is a need to calibrate the geophysical signals obtained with a set of analytical measurements. The sediment samples collected in this study have been analyzed for several parameters useful for mapping sediment characteristics. Figure 2-15 shows the confirmatory sediment sampling locations.

General Comments

Confirmatory sample results are found under the *PHASE2\SEDIMENT* subdirectory. Confirmatory samples are designated with a "CC-" or a "CG-" at the beginning of the **TAMS ID** specifying a core or grab sample, respectively. The middle three digits indicate the station number and the last four digits indicate the core depth interval in centimeters. For example, CC-080-0510 is a sample from a confirmatory core at station 80 collected from the core interval between 5 and 10 cm. These samples provide information on the spatial distribution of sediment properties from Bakers Falls to Lock 5. Northing and easting must be used to isolate samples among the various study areas since the areas were not sampled sequentially. Sample duplicates were collected, representing laboratory duplicates, field split samples and co-located field samples. Results of co-located duplicate pair analyses and laboratory duplicates have been averaged for use in data analysis. Field split samples have not been averaged. Individual sample analyses used in calculating the average values are found in sample duplicate tables. The results representing averaged values are indicated by the entry in the **Split** field within the data tables. The key to the **Split** field can be found in the **PARAMS** glossary. Some confirmatory samples are labeled with an "X" in the **TAMS Type** field. These samples represent cores subjected to X-radiography.

The main river section of consideration for the confirmatory samples extends from Rogers Island to Lock 5. Samples collected from river zones from Rogers Island to Lock 5 (which includes the Thompson Island Pool) can be considered representative of the river sediments in this area. These samples can be grouped together to obtain mean properties for this river section on a spatial basis. The best large-scale spatial interpolation of these values can be made using the side-scan sonar interpretation maps created as part of the geophysical investigation in a geographic information system (GIS).

Confirmatory samples collected from the Bakers Falls pool, that is, from above Bakers Falls near the Fenimore Bridge, do not represent the local characteristics. The river bottom in the area is mostly bedrock, while the samples were obtained from relatively fine-grain sediments from a few peripheral areas due to sampling access limitations. The samples are only representative of the small zones of fine-grained sediments in this area. The zone below Bakers Falls and above Rogers Island, *i.e.*, the remnant deposit area, has unique sedimentological characteristics based on sediment samples and the hydrological conditions noted there. The grain size distributions obtained from the samples in this area may be biased. The physical sample sizes were too small to ensure a statistically representative data set since this zone contains some areas with gravel and cobbles which could not be sampled. These samples should reflect the basic characteristics of the sandy sediments in this zone.

Grain Size Distribution Analysis

In general, the grain size distribution data from the confirmatory sampling program can be used for qualitative analysis but *not* quantitative analysis. Due to the relatively small sample size (*i.e.*, 200 to 500 g samples) and the frequent occurrence of gravel-sized particles, a potential uncertainty exists in the ratio of the gravel fraction to the sand and finer fractions. This matter will

be discussed at length in the data usability section of the Data Evaluation and Interpretation Report. In the Confirmatory Sampling Program, both the sieve and laser particle analyses were performed on comparable sample sizes (i.e., 200 to 500g). However, the data user is cautioned against combining the sieve and laser particle analysis data directly due to possible systematic differences in the results from the two techniques. The analysis name is included in the parameter so as to remind the user that the data are derived from two distinct methods (e.g., clay % (sieve) and clay % (laser)). Paired sieve and laser particle analyses provide a point of reference for direct comparison between the measurement techniques. For internal consistency, TAMS/Gradient recommends using the laser grain size data to characterize the river bed.

Total Carbon/Total Nitrogen and Total Inorganic Carbon

These data can be used to derive a close approximation of the total organic carbon (TOC) of the sediments by subtracting the total inorganic carbon (TIC) from the total carbon (TC). These results have been designated in the database as "TOC (calculated)." Rules for the calculations are given below. The TIC is generally negligible so that TC and TOC (calculated) were nearly identical. Total nitrogen (TN) can be used with total carbon as an indicator of wood cellulose (wood chips) in the sediments. A high C to N ratio (C/N) implies high cellulose content.

TOC Calculation Rules

TC	TIC	TOC (calculated)
Null	Value	No calculation possible
Value	Null	Assume TOC = TC
Value	Non-detect	Assume TOC = TC
Non-detect	Non-detect	Assume TOC = non-detect
Value	Value	TC - TIC = TOC

Sediment Description

As part of the confirmatory sample collection process, sediment samples were classified according to the TAMS field classification procedures. These procedures are based on the ASTM visual description and identification of soils methodology. The TAMS field procedures were used to describe the sediment samples on the basis of the ASTM standard soil classification. In addition, reduction-oxydation potential (redox) was measured for most samples. The sediment classification and redox data are contained in the **SEDDESC** table. The terms used in the sediment descriptions are defined in the **PARAMS** glossary.

2.5.3 High-Resolution Sediment Coring Study

High-resolution core data can be found in the *PHASE2\HRCORES* subdirectory. High-resolution sediment core samples are designated by the initial letters "HR" in the **TAMS ID**. The PCB profiles recorded in the high-resolution sediment cores provide an historical record of water column transport by suspended matter and do not provide a spatial representation of sediment PCB contamination in the river. The term "high-resolution" refers to the fine slicing intervals used in subdividing these cores. A listing of core sites follows; Figures 2-16A and 2-16B show the Upper and Lower coring sites, respectively.

High-Resolution Sediment Cores

River Mile	Location	Core No.	Station ID
202.9	Background - Bishop's Dock	27	HR-027
197.1	Bakers Falls	28	HR-028
194.1E	Rogers Island East	26	HR-026
194.2W	Rogers Island West	25	HR-025
191.2	Thompson Island Pool	20	HR-020
189.3	Thompson Island Pool	23	HR-023
188.5	Thompson Island Dam	19	HR-019
185.8	Above Lock #5	18	HR-018
(NA)	Batten Kill #2	17	HR-017
177.8	Stillwater Pool	22	HR-022
177.8	Stillwater Pool	21	HR-021
166.3	Above Lock #3	16	HR-016
(NA)	Hoosic #4	24	HR-024
159.0	Below Lock #1	15	HR-015
(NA)	Mohawk	12	HR-012
143.5	Albany Turning Basin	11	HR-011
124.1	Stockport	14	HR-014
99.2	Tivoli Bay	13	HR-013

High-Resolution Sediment Cores (Cont'd)

River Mile	Location	Core No.	Station ID
88.5	Kingston	10	HR-010
59.6	Denning's Point	9	HR-009
54.0	Foundry Cove	8	HR-008
43.2	Lent's Cove	7	HR-007
43.2	Lent's Cove	6	HR-006
25.0	Piermont Marsh	1	HR-001
2.4	Mid-Harbor	4	HR-004
(NA)	Newtown Creek (NC 7)	5	HR-005
-1.9	Upper NY Bay	2	HR-002
-2.2	Upper NY Bay	3	HR-003

High-resolution cores are labeled in a similar manner to the confirmatory cores. The middle three digits contain the coring location site number. The last four digits in the sample identifier capture the core depth interval in centimeters. For instance, HR-001-0406 is a sample from a core at station 1 (Piermont Marsh) taken from the 4- to 6-cm depth interval.

High-resolution core intervals with field duplicate analyses are indicated by a "D" in the **TAMS Type** field. Field duplicate samples were collected from a single core slice but were *not* homogenized prior to analysis and thus are considered co-located samples. Duplicate high-resolution cores, co-located cores, *i.e.*, Nos. 6 and 7 and Nos. 21 and 22, are duplicate core pairs for the dating analysis. A comparison of these cores will be discussed in the Data Evaluation and Interpretation Report to be published in the near future. Individual slices of these cores *cannot* be compared as field duplicate samples (*e.g.*, HR-006-2024 and HR-007-2024) due to potential differences in the sedimentation rates between the cores.

As part of the high-resolution sediment core collection process, four cores were collected at each site. These are labeled P, A, G, X in the **TAMS Type** field. These four cores were closely co-located at each coring site. They were necessary because of the limited material for sample analysis available in an individual core. The "P" or primary core was sliced and subdivided into 2- to 4-cm layers and used for PCB, TC/TN, TOC and radionuclide analysis. Thicker layers (*i.e.*, 4-cm layers) were also used to provide material for small volume (2cc) laser particle analyses. The "A" or archive core was used to provide material for small volume laser grain size analyses for the 2-cm slice intervals spanning 0-8 cm in the core, as well as to provide an archive in case additional sediment analyses were needed. In a limited number of cases, the 0-

to 2-cm and 2- to 4-cm slices from these cores were analyzed for PCBs and radionuclides. The "G" or grain size analysis core was used to provide a large volume laser grain size sample, typically integrating the equivalent of 2 to 4 layers in the "P" core. It was also used to provide a large sample for PCB congener laboratory quality control. The remaining core, labeled "X" for x-ray was intended for x-ray photography to examine sediment structure; however, x-ray photography was not performed for high-resolution cores.

Supplemental core tops, *i.e.*, 0- to 2-cm intervals, are available for a number of locations. These cores were collected prior to the main Phase 2 coring effort as part of the site selection process. These core tops are assigned core numbers 29 through 35 and are labeled with a final "A" in the **TAMS Type** field of the database. In addition, several core tops were collected in April 1992 from very high deposition zones in the saline Lower Hudson such as boat basins, and analyzed for PCBs and radionuclides. These samples are identified as cores 36 through 39, also labeled with an "A." For all samples labeled with an "A," it should be noted that the PCB analyses were performed on dried sediments beyond the standard seven-day holding time. The table below describes these samples.

Supplemental High-Resolution Core Top Samples

TAMS Sample ID	LDEO No.	River Mile	Corresponding Core (and RM)	Location
HR-029-0002A	2163A		12	Mohawk #3
HR-029-0002D	2163A		12	Mohawk #3
HR-030-0002A	2133A	99.2	13 (99.2)	Tivoli Tsc
HR-031-0002A	2152A	124	14 (124.1)	Stockport Sfe
HR-032-0002A	2178A	159.0	15 (159.0)	159.0
HR-033-0002A	2175A		17	Batten Kill
HR-034-0002A	2219A	194.2	25 (194.2W) and 26 (194.1E)	Rogers Island
HR-035-0002A	2220A	194.3	25 (194.2W) and 26 (194.1E)	Rogers Island
HR-036-0002A	2126A	6.27		Lower Hudson Boat Basin
HR-037-0002A	2123A	12.9		Lower Hudson Boat

Supplemental High-Resolution Core Top Samples (Continued)

TAMS Sample ID	LDEO No.	River Mile	Corresponding Core (and RM)	Location
				Basin
HR-038-0002A	2124A	13.25		Lower Hudson Boat Basin
HR-039-0002A	2121A	17.9		Lower Hudson Boat Basin

PCB Congener Analysis

Identifiers for high-resolution sediment core samples with associated PCB congener data contain a "P" in the **TAMS Type** field with few exceptions. Those samples labeled with a "G" should not be used since these are quality control samples; these samples represent large core slice intervals from co-located cores without any radionuclide information. High-resolution sediment cores *should not be grouped collectively* into one large data set for data analysis due to major differences in *in-situ* conditions, local PCB loadings and variations in sediment deposition rates. Core samples ending with an "A" with associated PCB results generally represent core slices from the 0- to 2-cm interval in a supplemental high-resolution core given in the table above. For all cores in the above table, information on the beryllium-7 and cesium-137 levels in the core interval is also available. For the supplemental cores collected in the Upper Hudson, these "A" samples were analyzed for PCBs and radionuclides because the beryllium-7 levels in the comparable "P" core slice were not detectable.

The PCB congener data include averaged co-located sample pairs identified by the **Split** field in the **PCBS** database table. The original duplicate pair results can be found in the **PCBSD** database table.

For the calculation of the **Value2** and the homologue, total PCBs and Aroclor sums, the high-resolution core results were grouped geographically, as previously described in Section 2.5. The sample grouping used for determining frequency of non-detected PCB congeners is provided below.

High-Resolution Sediment Core Sample Groups for Determining Frequency of Non-Detected PCB Congeners

Group	Core Numbers	River Mile
Upper River	15, 16, 18, 19, 20, 21, 22, 23, 25, 26, 28, 32, 34, 35	197.3 to 156
Lower River freshwater	10, 11, 13, 14, 30, 31	153 to 60.1
Lower River saline	1, 2, 3, 4, 5, 6, 7, 8, 9, 36, 37, 38, 39	60 to -2
Background and tributaries	12, 17, 24, 27, 29, 33	

Conventional Parameters

All conventional parameters are stored in the table **NONPCBS** except for the radionuclide data which resides in **RADNUC**. For information regarding total carbon/total nitrogen and total inorganic carbon refer to the discussion in Section 2.5.2 concerning the confirmatory sampling program. All high-resolution sediment core grain size analyses were performed using the laser particle method. However, there were two sample types: small-volume (SV) and large-volume (LV).

The LV samples provide an accurate, unbiased representation of grain size distribution (*i.e.*, percent gravel, sand, silt, and clay). It should be noted, however, that these samples represent 8-cm slices from 0 to 8 cm in depth as noted in the **TAMS ID** field. These samples were obtained exclusively from the "G" core. There is one LV sample per core except for core 25. All other high-resolution grain size samples are SV samples and should only be used to represent differences in the fine-grained fraction (silt, clay and possibly sand) among samples. These samples have a "P" or an "A" in the **TAMS Type** field. Core samples for grain size distribution analysis were obtained from the co-located "A" core for the upper four core slices, *i.e.*, intervals 0 to 2, 2 to 4, 4 to 6, and 6 to 8 cm, because of sample volume limitations. The remaining SV samples were collected from the "P" core. Because of the general homogeneity of sediment in an individual high-resolution core, the grain size distribution results from the "A" core can be correlated with the other analyses for the corresponding "P" core intervals without additional correction. Total organic nitrogen data were obtained for a subset of the high-resolution core samples. All TON samples were obtained from the core intervals below eight centimeters because of sample volume limitations. The TON values measured by Chemtech do not correspond well to the total nitrogen values measured by the Lamont-Doherty Earth Observatory method which may be partially due to the differences in analytical techniques.

Measurements of radionuclides in high-resolution core sediments, including ^{134}Cs, ^{137}Cs,

^{7}Be, and ^{60}Co, were provided by Lamont-Doherty Earth Observatory. There were no field co-locates or splits for these samples. These data are reported with the measured value as well as a counting error representing a one standard deviation error. In general, the reported value must be greater than two standard deviations to be considered a detection.

2.5.4 Low-Resolution Sediment Coring Program

The low-resolution sediment coring program took place during July and August 1994. Figures 2-17A through 2-17D show these coring locations.

The results of the low-resolution sediment coring program are contained in the *PHASE2\SEDIMENT* subdirectory along with the confirmatory sample results. Both data sets can be used to characterize the sediments of the Upper Hudson. Samples collected for the low-resolution coring program are labeled with an initial "LR" or "LH" and generally follow the other sediment core naming schemes. The "LR" refers to cores collected in the Thompson Island Pool. The "LH" refers to cores collected in *hot spot* areas below the Thompson Island Dam. The middle three digits in the **TAMS ID** refer to the core location. The first two digits give the coring site or cluster and the last digit, a letter, refers to the location within the cluster. For LR samples, the core site refers to Phase 2 coring clusters and has no relationship to any specific *hot spot*. For the LH samples, the site number refers to the original NYSDEC *hot spot* number (Numbers 25 to 40). There are also several LH sites with numbers greater than 40. These represent additional sites sampled during the program.

The last four digits of the **TAMS ID** refer to the sediment sampling depth. However, due to the extensive length of the low-resolution cores, these digits represent inches, not centimeters as in the other core identifiers. For example, LR-10D-0001 represents the sample from the fourth core (D) collected in the Thompson Island Pool at cluster 10 obtained between 0 (00) and 1 inch (01) of depth. LH-25A-0816 represents the sample from the first core collected at *hot spot* 25 obtained between 8 and 16 inches of depth.

The letters "D" and "M" are used in the **TAMS Type** field. "D" signifies a field split sample. These sample results are located under the *PHASE2\SEDIMENT\QA_QC* subdirectory in the tables **PCBSD**, **LASERGSD** and **SIEVEGSD**. Field splits are not averaged. The "M" indicates the sample was collected for laboratory quality assurance in addition to its regular purpose. These sample results can be used as regular analyses.

It is important to note that the locations for the confirmation and low-resolution core sites were surveyed in place by licensed surveyors. The coordinates reported for all other programs represent estimates made from various maps and are of lesser accuracy.

Analytical Results

PCB congener results are reported in **PCBS** and **PCBSD** in the *PHASE2\SEDIMENT* subdirectory following the same PCB result summation process described for the water column and high-resolution coring program. The low-resolution coring data were considered to be one group for the treatment of non-detect results.

As part of the low-resolution coring program, samples were analyzed for PCB congeners, grain size distribution by both laser particle and sieve techniques, radionuclides and total organic carbon. Bulk density was determined for the sample by directly weighing a measured volume in the field. Particle density was determined using the bulk density result and the percent solids measurement determined on a large fraction of the sample. Like the confirmatory samples, both grain size data and descriptive data are available to characterize the low-resolution core sediments. Grain size data are available for all low-resolution core tops based on laser particle analysis. Grain size distributions based on the standard sieve and hydrometer analysis are available for about 150 samples. Reduction-oxidation (Redox) data are available for some low-resolution cores. In total, these data will be used to characterize the sediments of the Hudson as well as to compare current conditions with those measured by previous studies, particularly the 1984-1985 NYSDEC sediment survey.

2.5.5 Ecological Program

The Ecological Program under Phase 2 included a field investigation which took place in August and September 1993. The ecological field results are located in the *PHASE2\ECO* subdirectory; the sampling stations are shown in Figures 2-18A and 2-18B for the Upper and Lower Hudson, respectively.

The ecological field investigation involved the collection of fish, benthic invertebrates, and sediments from 20 sites located throughout the Hudson River (See Table 2-10). Five sites were within the Thompson Island Pool. At each sampling site various combinations of fish, benthic invertebrates and sediments were collected, generating up to five co-located samples per medium per site. Fish and benthic invertebrate samples were classified and sorted by species prior to analysis. In some cases, benthic invertebrate species were recombined into total benthic invertebrate samples. Data were obtained for the fish and benthic invertebrate samples defining the individual and average animal length and weight.

Ecological samples can be identified by an initial "EC" in the **TAMS ID**. The next digit refers to the matrix: "F" for fish, "B" for benthic invertebrate, and "S" for sediment. The fourth and fifth digits define the station number 1 through 20. The last four digits define the co-located number for the sample. The second identification field, **TAMS Type**, is used to indicate field split samples for the benthic invertebrate and sediment samples. No field splits or co-locate samples were obtained for the fish analysis program. Sediment and benthic invertebrate field split samples are labeled with a "D." The samples labeled with an "M" are laboratory quality assurance

samples but the data are of equal quality to any other result. Because of the additional complexity of animal species information, a third field, **Species,** was added to the ecological sample identification. In the database tables, the species are represented by a four-letter code. The key for the species code will be found in the **SPECIES** data table in the *Phase2\ECO* subdirectory. Two examples of the ecological sample ID are given here. EC-F03-0002 represents the second co-located sediment sample collected at ecological station 3. EC-B05-0004-IS represents the fourth co-located benthic invertebrate sample from station 5 consisting of isopods.

In a limited number of cases, the benthic co-located samples from a given site did not contain sufficient material to generate a sample. In these cases, two samples were composited. These are noted in the last four digits of the **TAMS ID** field whereby the first two digits give the first co-located sample number and the second two digits give the second co-located sample number. For example, EC-B12-0203 represents the composite of co-locate numbers 2 and 3 from ecological sampling site 12.

Note that the co-locates for each medium do not match exactly, *i.e.*, co-locate number 1 for sediment must not be matched to co-locate number 1 for benthic invertebrates. Instead, co-locates for each matrix should be compared as a single unit to co-locates in another matrix for the same site. In general, due to the inherent difficulties in fish collection, the area represented by the sediment and benthic invertebrate samples for a given station was smaller than that for the fish sample.

Analytical Results

PCB congener analyses were performed on fish, benthic invertebrates and sediment samples. Every station did not, however, have samples from all three matrice. PCB results were tabulated in **Value1**, **Value2** and the various sums described in previous sections. However, due to improvements in the analytical techniques, an additional 13 congeners were added to the list of reported PCB congeners. These 13 were ignored for the purpose of generating homologue, total PCB and Aroclor sums so as to maintain consistency across the entire Phase 2 data set.

In addition to PCB congener analyses, data were obtained on percent lipid content, animal weight and length for fish samples. Fish samples were analyzed by species. For the benthic invertebrate samples, percent lipid content and total sample mass weight were measured. Benthic invertebrate samples were analyzed by species when sufficient individuals were present. Species composite samples were also run. Sediment analyses included total organic carbon, laser particle grain size distribution, and metals.

The data pertaining to non-PCB analyses are located in the *PHASE2\ECO* subdirectory in the **NONPCBS** and **NONPCBB** tables for sediment and biota data, respectively. Specific fish and benthic invertebrate sample information such as length can be found in the **FISH** and **BENTHIC** database tables. Sample groupings for the purpose of dealing with non-detect results can be found in the **GROUPS** data table.

2.5.6 Calculated Flow Data

Flow measurements at the USGS stations at Waterford and Stillwater were not available in 1993 due to construction in these areas during this time period. As a result, flow at these locations had to be estimated from other available data. The creation of the flow estimates is documented in the Data Evaluation and Interpretation Report. In general, flows were estimated based on the reported flow at Fort Edward and the staff gauge readings collected at the locks of the Upper Hudson. Calculated flow data are contained in the table **FLOW93** in the *PHASE2\FLOW* subdirectory.

Flows were calculated for January through September 30, 1993 for the Hudson River at both Stillwater and Waterford. The data table also contains two additional fields indicating the specific model used to calculate a given day's flow. Several flow calculation models were used for each station to allow each day's flow to be calculated with all available data for that day. The details of the models are provided in the Data Evaluation and Interpretation Report.

Since the creation of these flow estimates, the USGS has released its own estimate of flow at these locations. These estimated flows are included in the database tables under the *USGS* subdirectory. However, all flow and transport analyses conducted for 1993 for the Reassessment utilize the flow estimates contained in **FLOW93**.

2.6 NOAA Ecological Sampling Program

During the ecological field investigation, additional fish samples were obtained by the field crew and provided to the National Oceanic and Atmospheric Agency (NOAA). These samples were intended to supplement the Phase 2 ecological investigation. These samples represent fish from 10 of the 20 ecological sampling sites.

The NOAA results are in the *NOAA* subdirectory. Because they were collected during the Phase 2 investigation, they have been labeled in the same manner as the Ecological Program samples. In fact, the structures of the sample identification fields (**TAMS ID**, **TAMS Type** and **Species**) as well as the data table structures themselves are identical to the Phase 2 ecological data set. The **TAMS Type** field is labeled with an "N" to indicate that these samples were analyzed by NOAA.

The samples were analyzed for PCB congeners by the same laboratory and technique used for the Phase 2 investigation. In this manner, the data are analytically identical to that of Phase 2. The only analytical difference arises from the data validation. NOAA samples will be validated to NOAA standards while the Phase 2 data are validated to USEPA standards. This difference is unlikely to affect the comparability of the data sets. The PCB congener results were treated identically to that of the Phase 2 data, with **Value1, Value2** and the congener sums generated in the same manner.

In addition to PCBs, data were obtained for percent lipid content, animal length, and weight for the NOAA samples. The percent lipid data are located in the **NONPCBB** table. In addition, the animal length and weight data are located in the **FISH** table.

2.7 Aroclor Standard Analysis

As part of the Phase 2 analytical program, analytical standards representing six Aroclor mixtures were obtained from ULTRA Scientific of North Kingstown, RI and AccuStandard, Inc. of New Haven, CT. These standards represented Aroclors 1221, 1232, 1242, 1248, 1254 and 1260. The analyses were performed by the contract laboratory on three separate occasions, once in September 1992 and twice in April 1994, using the same analytical system as used for the Phase 2 PCB congener analyses. These results were used to characterize the Aroclors on a congener-specific basis. This information in turn became the basis for assigning individual congeners to each Aroclor for the purpose of determining Aroclor concentrations in Phase 2 samples.

The results of the Aroclor standard analyses are contained in the file **AROCLSTD** under the *PHASE2* directory. The criterion for assigning a congener to an Aroclor was based on mass percentage. Specifically, if a congener represented 0.1% or more of the mass in a given Aroclor, it was included in the Aroclor concentration estimate (or sum). The results of applying this criterion to the Aroclor standard analyses are summarized in the table **ASCREEN** in the *PHASE2* directory. This table shows the assignments of each congener to the six Aroclor standards. The table is structured as a matrix of congener number by Aroclor standard. When the congener is assigned to a specific Aroclor, a value of unity is placed in the corresponding cell. When a congener is not considered present in the Aroclor standard, the cell is left blank.

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3. DATABASE USER'S GUIDE

3.1 Assumptions

This guide to using the database assumes a basic knowledge of computer database management software. Skills needed to navigate the database include the ability to browse database tables, to link multiple tables in a database query, and to apply simple logic in a database query for extracting the appropriate information. The database was developed in the PC-based Paradox™ 4.0 database management system but may be used in other relational database management packages provided they are compatible with the electronic file formats. Database files are provided on CD-ROM in two formats, the original Paradox™ 4.0 format and a FoxPro™/DBase III™ format. Comprehensive documentation of electronic files is provided in this chapter, including field definitions for database tables and diagrams of database linkages. Practical examples for common queries and applications of the database are provided in this chapter.

3.2 Data Dictionaries and Glossaries

Data dictionaries for all database tables are provided in this report. The data dictionaries are grouped by directory and subdirectory. Each set of directory and/or subdirectory data dictionaries is preceded by a table listing data dictionaries contained within. The database contains more than 100 tables; refer to the list of tables given in the table of contents. As this chapter touches on each of the database components, the reader will be referred to the relevant data dictionaries. The glossaries which define the terms of the database are contained in the database itself. (See Figure 2-2 for files coded with an asterisk).

3.3 Using the Data

A theme common to nearly all components of the TAMS/Gradient Hudson River database is the notion of the *one-to-many* relationship. Simply put, a *one-to-many* relationship exists when a single record or row in one database table links to many records in another database table. This design suits the nature of monitoring data because often multiple parameters are associated with a single sampling location. Figure 3-1 shows an example of *one-to-many* relationships from the *PHASE2\HRCORES* subdirectory. In the center is the **STATIONS** table where one record representing a single sampling location is linked, not only to many records in the **PCBS** table containing the congener results, but also to many records in the **NONPCBS** table containing conventional or non-PCB results. Each table is linked by the **TAMS ID** and **TAMS Type** fields. This figure illustrates the basic building block in the database design, and understanding the approach described will assist the reader in properly applying data analysis to the database. Specific details inherent to each data set vary among directories and are covered below.

The remainder of Section 3-3 discusses the individual data directories and the relationships among the database tables. Each directory is represented in a figure showing these relationships. In these figures, rectangles are used to distinguish reference tables; circles denote

tables which provide sample definitions; diamonds represent tables which contain analytical and field data. The sizes of these shapes are varied to emphasize the main database tables. The main database tables are emphasized in the larger circles and diamonds.

3.3.1 Historical Data

Table 3-1 describes the look-up table **HIST_LUT** in the *HISTORIC* directory. The **HIST_LUT** table is a glossary for the database parameters and fields contained in the databases of the *HISTORIC* directory. In addition, Table 3-2 describes the **PARAMKEY** table in the *HISTORIC* directory. The **PARAMKEY** table provides a parameter key for the **GE89** table under the *HISTORIC\SED* subdirectory and the **CONCFISH** table in the *HISTORIC\FISH* subdirectory.

Sediment Data

In the historical sediment subdirectory, there are more than 4,700 samples for the period 1976 through 1990. Figure 3-2 shows how the tables in the *HISTORIC\SED* subdirectory are linked. A listing of the database tables follows, and is also provided in Table 3-3. Database table field definitions are given in Tables 3-4 through 3-16.

Tables in *HISTORIC\SED* Subdirectory

Table Name	Description
SAMPLES	Sediment sampling information NYSDEC/OBG (1976-1978) NYSDEC/NYSDOH (1984-1985) GE/Harza (1990)
STATIONS	Station number correspondence to **GradNo** (a unique sample identifier for database purposes)
GRADNUMS	Core section correspondence to **GradNo** sample identifier
SECTION	Section number, depths, and correspondence to **GradNo** sample identifier
REACHES	River reach numbers
CONCSED	PCB Aroclor data - sediment samples
NONCHEM	Non-PCB data - sediment samples
SOXHDUP	Duplicate PCB Aroclor data using soxhlet extraction
NONDETS	Key to non-detected qualifier codes
REF	Key to references used in building the database
TEXTURES	Sediment description key

Tables in *HISTORIC\SED* Subdirectory (Continued)

Table Name	Description
GE89	Preliminary 1989 GE sediment baseline studies GE/Harza (1989)
MASSPEC	Results for GC/MS performed for sediments collected during 1984-1985 NYSDEC survey of Upper Hudson

As an illustration of the database format, excerpts from the main sediment database tables are summarized below in four tables. Each of these tables is linked by a unique sample identification number (**GradNo**), *e.g.*, 30000, 30016, 30032 and 30208 shown here.

The **SAMPLES** table contains information including sample date, location (River Mile, distance from bank, and northing and easting coordinates, where available), sample type (grab versus core), water depth, surface elevation, and type of sampler used. The table below provides example records, although precise field names have been expanded from their abbreviations so that the reader need not refer to the field definitions.

Excerpt from the Sample Information Table (SAMPLES)

GradNo	Type	M/D/YR	River Mile	Feet from West Bank	Northing (ft)	Easting (ft)	Sampler	Water Depth (ft)	Elev (ft)
30000	Grab	5/21/77	168.8	330.05	1071755	685695	100		
. . .									
30016	Core	3/18/77	188.4	100.0	1163740	698970	100	5.8	119.6
. . .									
30032	Core	3/18/77	183.4	60.0	1140410	669040	100	2.2	102.4
. . .									
30208	Core	6/6/78	192.5		1182860	696350	40	7.0	119.2

Core samples in the **SAMPLES** table are linked by **GradNo** with the core section (**SECTION**) table, which identifies the length of each core sample section and the depth beneath

the river bottom, *i.e.*, the interval of sample penetration given by the top and bottom of each section. Only core sample IDs appear in the **SECTION** table and many sections are associated with a single sampling location. No grab sample IDs appear in the **SECTION** table because no depth intervals are associated with them.

Excerpt from the Core Section Table (SECTION)

GradNo	Core Section No.	Bottom of Section (in)	Top of Section (in)
30016	1	1	0
30016	2	2	1
. . .			
30016	12	12	11
. . .			
30208	1	6	0
30208	2	9.5	6
30208	3	12	9.5

Most database queries involve linking **SAMPLES** (and **SECTION**, for cores) to the main database table containing the PCB results, **CONCSED**. Selecting a **GradNo** from **SAMPLES** and **SECTION** and locating the same **GradNo** in the **CONCSED** data table shows either the Aroclor results for an entire grab sample or section-by-section results for core samples. Additional information describing analytical measurement methods, that is, extraction method, are contained in the database as available.

Excerpt from the Chemical Data Table (CONCSED)

GradNo	Parameter	Core Section No.	Extraction Method	Concentration (ppm)
30000	Aroclor 1016		shake	1.0
30000	Aroclor 1221		shake	1.0
30000	Aroclor 1254		shake	1.0
30016	Aroclor 1016	4	soxhlet	6.0
.				

GradNo	Parameter	Core Section No.	Extraction Method	Concentration (ppm)
. .				
30016	Aroclor 1254	12	soxhlet	0.1
30032	Aroclor 1016	5	soxhlet	234.0
. . .				
30032	Aroclor 1254	5	soxhlet	163.0

Finally, non-chemical data, such as sediment texture class and percent volatile versus total solids, are contained in the **NONCHEM** table. **SAMPLES** is linked to **NONCHEM** through the **GradNo**. The same IDs for the example records for the previous tables are shown.

Excerpt from the Non-Chemical Data Table (NONCHEM)

GradNo	Core Section No.	Parameter	Value
30000		% total solids	78.93
30000		% volatile solids	0.85
30016	1	texture	GRAVEL
30016	4	% total solids	85.97
30016	4	% volatile solids	2.2
. . .			
30016	12	% total solids	89.23
30032	1	texture	CL-WC
. . .			

30032	5	% volatile solids	25.39

The remaining database tables provide reference information for the main database tables. **STATIONS** is a two-field table that shows the correspondence between the assigned **GradNo** and the original NYSDEC or GE station number. **GRADNUMS** cross-references the Agency or investigator who collected the data and is linked back to **SAMPLES** and **REF**. Duplicate PCB measurements made using soxhlet extraction reside in a side table called **SOXHDUP**. The key to non-detected data qualifier codes is given in **NONDETS**. **REACHES** indicates the upstream and downstream river miles associated with river reach numbers for the Upper Hudson River. The last table in the *HISTORIC\SED* subdirectory, **GE89**, holds the preliminary 1989 GE baseline studies results separate from the other database tables.

Fish Data

Figure 3-3 shows how the database tables contained in the *HISTORIC\FISH* subdirectory are linked. Table 3-17 and the table below describe the contents of each database table. Tables 3-18 through 3-25 explain field names and types in more detail. Results for over 10,000 samples collected from 1973 through 1993 are available in three main database tables: **GRADNUMF**, **SAMPLEF**, and **CONCFISH**. These three tables accommodate most database queries. **GRADNUMF** provides the master index to sample IDs (**GradNo**) and the corresponding original NYSDEC sample identifiers: laboratory number (**Labno**) and sample tag identifier (**Tagno**). **SAMPLEF** is similar to the **SAMPLES** table found in the *HISTORIC\SED* subdirectory and contains sampling information such as location descriptor, river mile, sampling date, species and preparation code. If a sample is composed of more than one individual fish, there will be a number greater than 1 in the **Noincomp** field (number of fish in composite) and a record in the **COMPOS** table connecting sample group weight and length statistics to the sample record. **SAMPLEF** is linked to the data table with all the PCB Aroclor and percent lipid results called **CONCFISH** through the sample ID (**GradNo**). The four tables, **PARAMKEY**, **PREP**, **SPECCODE**, and **REF**, contain keys to parameter codes, preparation codes, species codes and references, respectively, used in building the database. Finally, the **CORRNUM** table identifies corresponding old and new sample identifiers which have changed for some samples between the Phase 1 Report and this Report.

Tables in *HISTORIC\FISH* Subdirectory

Table Name	Description
GRADNUMF	Master index to GradNo
SAMPLEF	Fish sampling information (location, sex, age.....)
CORRNUM	Correspondence between old and new GradNo
COMPOS	Sample information for composite samples
CONCFISH	PCB Aroclor and percent lipid data - fish samples
PREP	Key to tissue and preparation codes
SPECCODE	Key to species codes
REF	Key to references used in building the database

Macroinvertebrate Data

Some macroinvertebrate data are available in the *HISTORIC\MACROINV* subdirectory. Figure 3-4 shows the database table relationships. The contents of each table are described below and in Table 3-26, while Tables 3-27 through 3-33 define the database fields. The macroinvertebrate sampling information in **SAMPLE** is linked through the sample ID field, **GradNo**, to the **CONC** table which contains the PCB Aroclor measurements. Species codes, sample type codes, and the number of individuals per sample are given in **SPECCODE**, **SAMPREF** and **NUMINDI**, respectively. There are approximately 800 samples but not all species could be identified based on the original documentation. **DOHSITE** contains multiplate and caddisfly sampling location information.

Tables in *HISTORIC\MACROINV* Subdirectory

Table Name	Description
SAMPLE	Macroinvertebrate sampling information
SAMPREF	Key to sample type
NUMINDI	Number of individuals in samples
CONC	PCB Aroclor results
OTHER	Additional species included in samples
SPECCODE	Species codes
DOHSITE	Multiple and caddisfly sampling information

3.3.2 Lamont-Doherty Earth Observatory

The *LDEO* directory contains four self-descriptive spreadsheet tables which provide several sediment core results as well as a PCB sediment/water partitioning study.

3.3.3 USGS

The database glossary for field names and parameters contained in the database tables under *FLOW* and *WQDATA* subdirectories is provided in the look-up table **USGS_LUT** in the USGS directory (See Table 3-34). A listing of the database tables follows, and is also provided in Tables 3-35 and 3-37. Database table field definitions are given in Tables 3-36 for *USGS\FLOW* and 3-38 and 3-39 for *USGS\WQDATA*.

Tables in *USGS\FLOW* Subdirectory

Table Name	Description
FTEDWD	Mean daily Hudson River flow at Fort Edward, 1976-1993
GREEN	Mean daily Hudson River flow at Green Island, 1946-1993
HADLEY	Mean daily Hudson River flow at Hadley, 1921-1993
CORINTH	Mean daily Hudson River flow below Sacandaga River near Corinth, 1921-1993
SCHU	Mean daily Hudson River flow at Schuylerville, 1977-1979
STILL	Mean daily Hudson River flow at Stillwater, 1977-1993

Tables in *USGS\FLOW* Subdirectory (Continued)

Table Name	Description
WATR	Mean daily Hudson River flow at Waterford, 1976-1993
BATK	Mean daily Batten Kill flow at Battenville, 1922-1968
HOOS	Mean daily Hoosic River flow near Eagle Bridge, 1910-1993
SACAND	Mean daily Sacandaga River flow at Stewarts Bridge, 1907-1993
MOHK	Mean daily Mohawk River flow, 1917-1993
USGS7693	Mean daily flow at all above stations, except Battenville, 1976-1993

The *USGS\FLOW* subdirectory includes USGS mean daily flow data in cubic feet per second collected at various stations.

Tables in *USGS\WQDATA* Subdirectory

Table Name	Description
USGSWQ	Water-column PCB, suspended sediment data, and sediment load, in tons/day, collected by the USGS
TOCDAT	Water-column total organic carbon (TOC) collected by the USGS

The *USGS\WQDATA* subdirectory includes water column PCB, total suspended sediment data, and sediment load in tons/day in **USGSWQ** and water column total organic carbon data in **TOCDAT.**

3.3.4 GE Data

The TAMS/Gradient team received data for over 2,000 samples from GE in several files, the most recent being GE081895.DBF and CP081895.DBF received in August 1995. The former file contains all the field sampling information, the homologue distributions, and the total PCB measurements for all sampling surveys combined. The latter contains the congener concentrations for all sampling surveys combined. The results have been divided into five main database tables with one reference table and three glossaries as shown below as well as in Table 3-40 and Figure 3-5. Data dictionaries for tables contained in *GE* are provided in Tables 3-41 through 3-49.

Tables in *GE* Directory

Table Name	Description
SAMPLE	Sampling information for all GE data contained in this directory
PCB	PCB data for all media
PCBHOMOL	PCB homologue data for all media
PCBCONG	PCB congener data for all media
NONPCB	Non-PCB data for all media
SPECCODE	Fish species code
PCB_LUT	Congener data glossary
GEPARAMS	Parameter abbreviations glossary
FIELD_LUT	Database field glossary

Sampling information such as sample date, location and medium (*e.g.*, water, sediment or biota) reside in the table **SAMPLE**. Samples for all matrices were assembled into a single **SAMPLE** table and hence not all the fields pertain to every record. For instance, **Age** applies only to biota or fish samples and not to sediment, water or pore water samples. Where a field does not apply, the entry remains blank or contains or a "0" as a placeholder. The **SAMPLE** table is linked to all the PCB and non-PCB results through the **NEA_file** identifier. Total PCB values, qualifiers, and quantitation limits are given in **PCB** for all media. Homologue distributions by mole percent and by weight percent are given in **PCBHOMOL** for all media. Congener concentrations are given in **PCBCONG** for all media. It appears that GE reported non-detected congeners as "0" in **PCBCONG**. **NONPCB** holds all conventional parameters, such as total suspended solids and total organic carbon, with abbreviations explained in **GEPARAMS**. A key to the congener peak numbers is provided in **PCB_LUT** which also gives a corresponding BZ number to relate these results to those being analyzed under the Phase 2 sampling programs.

3.3.5 New York State Department of Transportation

The **NYSDOT** directory contains the table **GAUGES** which provides the readings of staff gauges listed in Table 3-50.

3.3.6 Phase 2 Data

Database glossaries **CONG_LUT**, **FIELDS**, **PARAMS** and **QUALIFY** in the *PHASE2* directory are described in Tables 3-51 to 3-54 and serve as keys to congener, field name parameter and qualifier definitions, respectively, for tables in the *PHASE2* directory. Data dictionaries for **AROCLSTD** and **ASCREEN** are presented in Tables 3-55 and 3-56,

respectively.

Water Column Study Data

The *PHASE2\WATER* subdirectory combines the results from the water column transects, flow-averaged events, and PCB equilibration study under the Phase 2 sampling effort. The relationships between the main database tables, *i.e.*, **GROUPS**, **STATIONS**, **PCBW**, **PCBP**, and **NONPCBW**, are shown in Figure 3-6. All tables in the subdirectory are listed below and in Table 3-57, and field definitions are given in Tables 3-58 through 3-64.

Listing of Tables in *PHASE2\WATER* Subdirectory
(including Tables in *PHASE2\WATER\QA_QC* and *PHASE2\WATER\EQUILIB*)

Table Name	Description
STATIONS	Water column transects and flow-averaged events stations
GROUPS	Sample groupings
PCBP	PCB congeners/homologue sums/Aroclor concentrations - particulate samples (g/Kg)
PCBPD	PCB congeners - particulate duplicate pairs (g/Kg)
PCBPE	PCB congener - particulate samples - equilibrium study (g/Kg)
PCBFA7	PCB congeners/homologue sums/Aroclor concentrations - combined particulate and dissolved samples (ng/l) for flow-averaged event 7
PCBW	PCB congeners/homologue sums/Aroclor sums - water samples (ng/L)
PCBWD	PCB congeners - water duplicate pairs (ng/L)
PCBWE	PCB congeners - water (dissolved) samples - equilibration study (ng/L)
PCBWTT	PCB congeners - whole water samples (TT series) (ng/L)
NONPCBW	Non-PCB data - water column samples
NONPCBWD	Non-PCB data - water duplicate sample pairs
FB	Non-PCB data - field blanks
VOLUMES	Sample volumes filtered for PCB analyses

The **STATIONS** table contains sampling information such as the transect or flow-averaged event number, station number, sample identifier and type, river mile, and northing and easting coordinates where known. The sampling stations are associated with distinct zones in the river identified in **GROUPS**. **STATIONS** is linked to the six PCB data tables, *i.e.*, **PCBP**, **PCBW**,

PCBPE, **PCBWE**, **PCBFA7** and **PCBWTT**, through the **TAMS ID** and **TAMS Type** fields. Because congener results from the various efforts are so distinct (*e.g.*, sampling method or matrix), the TAMS/Gradient team felt it necessary to divide the data into separate tables to prevent mixing of data types.

PCBP and **PCBW** contain particulate and "dissolved" (*i.e.*, filtered water) PCB congener data, respectively, for the water column transects and the flow-averaged events. While duplicate pairs have been removed from the main database tables to **PCBPD**, for particulate or suspended-matter data, and **PCBWD** for dissolved-phase data, composited results following the method described in Chapter 2 have been returned to the main database tables, *i.e.*, **PCBP** and **PCBW**. The data in **PCBP** have been reported on a mass per unit mass basis, the same as the Phase 2 sediments. These values were obtained by dividing the reported results (ng/filter) by the volume filtered and the TSS value for the sample.

The results for the equilibration study are separate from the main database tables; **PCBPE** and **PCBWE** contain the equilibration study results for the particulate and dissolved fractions, respectively. A few whole-water PCB congener analyses were performed on samples taken for Transect 1 and the results reside in **PCBWTT**. Non-PCB measurements such as total suspended solids (TSS), dissolved organic carbon (DOC), and chlorophyll-*a* are given in **NONPCBW**.

As is the case with the PCB congener data, duplicate pairs have been placed in a supplementary table **NONPCBWD** with composited results placed in **NONPCBW**. Minor tables in this subdirectory include **FB**, which contains non-PCB data field blanks, and **VOLUMES**, which indicates the volume of water sample filtered for PCB analyses.

Sediment

The method for linking database tables in the *PHASE2\SEDIMENT* subdirectory is given in Figure 3-7. A listing of all tables in the *PHASE2\SEDIMENT* subdirectory is given below and in Table 3-65, while data dictionaries are given in Tables 3-66 through 3-73.

Tables in *PHASE2\SEDIMENT* Subdirectory
(including Tables in *PHASE2\SEDIMENT\QA_QC*)

Name	Description
STATIONS	Confirmatory samples and low-resolution core sampling stations
PCBS	PCB congeners/homologue sums - sediment samples (ìg/Kg DW) - low-resolution samples only
PCBSD	PCB congeners - sediment samples pairs (ìg/Kg DW)

Tables in *PHASE2\SEDIMENT* Subdirectory (Continued)

Name	Description
NONPCBS	Non-PCB data - sediment samples
NONPCBSD	Non-PCB data - duplicate sediment sample pairs
FB	Non-PCB data - field blanks
SIEVEGS	Grain size distribution data by sieve analysis
SIEVEGSD	Grain size distribution data by sieve analysis - sample duplicates
LASERGS	Grain size distribution data by laser particle analysis
LASERGSD	Grain size distribution data by laser particle analysis - sample duplicates
RADNUC	Radionuclide data - sediment samples - low-resolution only
RADNUCD	Radionuclide data - sediment samples field splits and laboratory duplicates
LRINFO	Supplemental information for low-resolution core samples only
SEDDESC	Descriptive sediment classifications, density, redox and other field data

As in the *PHASE2\WATER* subdirectory, a **STATIONS** table establishes the sampling locations either by river mile or by northing and easting pairs. The core depth interval for each sample is also indicated in this table. It was not necessary to break PCB congener results into multiple tables, as was the case for the water column study. **PCBS** holds all the PCB congener results including composited duplicate samples as described in Chapter 2. The original duplicate pairs are retained in **PCBSD**. **PCBS** and **PCBSD** are linked back to **STATIONS** through the **TAMS ID** and **TAMS Type**. No other PCB tables are included in this directory because only a single matrix (sediment) was sampled. Note that these tables do not contain results for the high-resolution coring study, which are given in the *PHASE2\HRCORES* subdirectory.

The tables **NONPCBS** and **NONPCBSD** contain all the non-PCB results including total carbon, total nitrogen, total inorganic carbon, total organic nitrogen, the C:N ratio, and summary grain size analyses in sediments. Again, **NONPCBSD** holds all the duplicate pairs, while **NONPCBS** holds composited duplicate results, and **FB** holds the field blank results. Radionuclide data generated for these samples required some additional fields not needed for the other data tables, such as **Detector**, for detector type, and **Sigma**, for the standard deviation of the counting result. **RADNUC** contains all radionuclide data; **RADNUCD** contains only sediment sample duplicate data. These two tables, together with **PCBS** and **PCBSD**, contain only low-resolution sampling information. The remaining tables in this subdirectory contain information on both low-resolution and confirmatory samples. Detailed laser grain size data including composited results are contained in **LASERGS** while sample duplicates are contained in **LASERGSD**. **SEDDESC** provides descriptive sample information based largely on field

observations for both confirmatory and low-resolution coring samples. **LRINFO** provides information pertaining to low-resolution coring sites. Specifically, it provides the corresponding 1984 NYSDEC sediment survey station number from Brown, et. al (1988) for the coring sites located in the Thompson Island Pool. It also provides the hot spot number for low resolution coring sites below the Thompson Island Dam.

Ecological Sampling

The tables contained within the *PHASE2\ECO* directory are shown in the table below. The data dictionaries are contained in Tables 3-75 through 3-84. Figure 3-8 illustrates how the database tables are linked.

Tables in *PHASE2\ECO* Subdirectory
(including Tables in *PHASE2\ECO\QA_QC* subdirectory)

Table Name	Description
STATIONS	Ecological survey stations
COORDS	Coordinates for stations
GROUPS	Sample groupings
BENTHIC	Sample composition information - invertebrates
FISH	Sample composition information - fish
PCBFISH	PCB congeners/homologue sum/Aroclor concentrations - fish
PCBFISHD	PCB congeners - diluted fish analyses
PCBINV	PCB congeners/homologue sum/Aroclor concentrations - invertebrates
PCBINVD	PCB congeners - invertebrate dup. pairs/dilultion analyses
NONPCBB	Non-PCB data - biota
NONPCBBD	Non-PCB data - biota duplicate pairs
PCBS	PCB congeners/homologue sums/Aroclor concentrations - sediment samples (ìg/Kg DW)
PCBSD	PCB congeners - sediment duplicate pairs (ìg/Kg DW)
NONPCBS	Non-PCB data - sediment samples
NONPCBSD	Non-PCB data - sediment duplicate pairs
LASERGS	Sediment laser grain size data
FB	Non-PCB data - sediment field blanks

Table Name	Description
SPECIES	Key to species codes
LASERGSD	Sediment laser grain size data - duplicate pairs

The **STATIONS** table, the main database table in the subdirectory, contains sampling information such as **TAMS ID**, **TAMS Type, Species** and location by river mile. **COORDS** is linked to **STATIONS** through the **Station** field, and contains locations by northing and easting pairs as well as sample types collected (*i.e.*, sediment, fish, benthic invertebrates). The **GROUPS** table, containing stations grouped by location, is linked to **STATIONS** in the same way. The **LASERGS** table contains grain size distribution data based on laser particle analysis on the ecological samples, and is linked to **STATIONS** via the **TAMS ID** and **TAMS Type**. **LASERGSD**, linked to **STATIONS** in the same fashion, contains information on duplicate pairs. **STATIONS** is linked to the PCB data tables **PCBS**, **PCBINV** and **PCBFISH** through the **TAMS ID**, **TAMS Type** and **Species** fields. The PCB tables, in turn, relate to the field data tables, *i.e.*, **BENTHIC** and **FISH,** through the same fields. The tables **PCBSD** and **PCBINVD,** which contain duplicate pair information, are supplementary. **PCBFISHD**, also supplementary, contains results for laboratory duplicate analyses for those samples requiring dilution. **NONPCBS** and **NONPCBB** contain all the non-PCB results for sediment samples and biota samples, respectively. Again, information about duplicate pairs can be found in **NONPCBSD** and **NONPCBBD**. These are all linked to **STATIONS** through **TAMS ID** and **TAMS Type** for sediment and **TAMS ID**, **TAMS Type** and **Species** for fish and benthic invertebrate samples. **FB** contains field blank data for ecological sampling program.

High-Resolution Cores

Figure 3-9 illustrates how tables in *PHASE2\HRCORES* are linked. A listing of tables in this subdirectory is given below and in Table 3-85. Data dictionaries are given in Tables 3-86 through 3-93.

Tables in *PHASE2\HRCORES* Subdirectory
(including Tables in *PHASE2\HRCORES\QA_QC* subdirectory)

Table Name	Description
STATIONS	Confirmatory Sampling and High-Resolution Sediment Coring Program sampling stations
PCBS	PCB congeners/homologue sums/Aroclor sums - sediment samples (ìg/Kg DW)
PCBSD	PCB congeners - duplicate sediment sample pairs (ìg/Kg DW)
NONPCBS	Non-PCB data - sediment samples

Table Name	Description
NONPCBSD	Non-PCB data - duplicate sediment sample pairs
FB	Non-PCB data - field blanks
LASERGS	Laser grain size Phi classes
LASERGSD	Laser grain size Phi classes - duplicate pairs
RADNUC	Radionuclide data - sediment samples
RADNUCD	Radionuclide data - sediment sample laboratory duplicates
SEDDESC	Redox, density and additional field information
GROUPS	Sample groupings

As in the *PHASE2\WATER* subdirectory, a **STATIONS** table establishes the sampling locations either by river mile or by northing and easting pairs. The core depth interval for each sample is also indicated in this table. In the *PHASE2\HRCORES* subdirectory, sampling locations in **STATIONS** are grouped by the identifiers supplied by the table **GROUPS**. It was not necessary to break PCB congener results into multiple tables, as was the case for the water column study. **PCBS** holds all the PCB congener results including composited duplicate samples as described in Chapter 2. The original duplicate pairs are retained in **PCBSD**. **PCBS** and **PCBSD** are linked back to **STATIONS** through the **TAMS ID** and **TAMS Type**. No other PCB tables are included in this directory because only a single matrix (sediment) was sampled in the high-resolution coring study.

The tables **NONPCBS** and **NONPCBSD** contain all the non-PCB results including total carbon, total nitrogen, total inorganic carbon, total organic nitrogen, the C:N ratio, and summary grain size analyses in sediments. Again, **NONPCBSD** holds all the duplicate pairs, while **NONPCBS** holds composited duplicate results, and **FB** holds the field blank results. Radionuclide data generated for these samples required some additional fields not needed for the other data tables, such as **Detector**, for detector type, and **Sigma**, for the standard deviation of the counting result. **RADNUC** contains all radionuclide data; **RADNUCD** contains only sediment sample laboratory duplicate data. Detailed laser grain size data including composited results are contained in **LASERGS** while sample duplicates are contained in **LASERGSD**. **SEDDESC** is similar in style to a table bearing the same name in subdirectory *PHASE2\SEDIMENT* in that it contains information on redox, sediment density and other descriptive field information.

FLOW

The *PHASE2\FLOW* subdirectory contains one table, **FLOW93**, which includes calculated 1993 flow data for Stillwater and Waterford. The **FLOW93** data dictionary is given in Table 3-94.

3.3.7 NOAA

Figure 3-10 illustrates how the database tables in the **NOAA** directory are linked. Table 3-95 and the table below list the database tables contained in the **NOAA** directory. Tables 3-96 through 3-102 comprise the data dictionaries for the above-mentioned tables. Glossary definitions can be found in the Phase 2 data glossaries. Groups for NOAA samples are the same as those for the Phase 2 ecological program and can be found in *PHASE2\ECO***GROUPS**.

Tables in *NOAA* Directory
(including Tables in *NOAA\QA_QC* subdirectory)

Table Name	Description
STATIONS	Ecological survey stations
COORDS	Coordinates for stations
FISH	Sample composition information - fish
PCBFISH	PCB congeners/homologue sum/Aroclor concentrations - fish
PCBFISHD	PCB congeners - fish dup pairs/dilution analyses
NONPCBB	Non-PCB data - biota
SPECIES	Key to species codes

The **STATIONS** table contains sample information such as **TAMS ID**, **TAMS Type** and **Species**, as well as station number and sample location by river mile. **COORDS** is linked to **STATIONS** through the **STATION** field and contains sampling locations by northing and easting pairs. The PCB data tables, **PCBFISH** and **PCBFISHD** (containing laboratory duplicate analyses for those samples requiring dilution), and **NONPCBB**, the non-PCB results table for fish (biota) samples are linked to the **STATIONS** table by **TAMS ID**, **TAMS Type** and **Species**. The tables **FISH** and **SPECIES** are similarly linked and contain field data and species information, respectively.

3.4 Database Application Examples

This section describes three example queries showing database manipulations of the draft Phase 2 data. While the examples are most relevant to the Phase 2 data tables, the same general concept may be applied to other subdirectories and data tables. Field definitions for all data tables are provided in the data dictionaries located in the Table Section of this report. The following discussion does not assume a specific database management software package, but rather relates general procedures for conducting database queries. The reader may need to refer to

software manuals for directions on performing queries for the specific database management software package being used.

1. Extract Total PCB values and Total Carbon/Total Nitrogen Ratios from High-Resolution Sediment Coring Data for Correlation Analysis.

This example demonstrates how to extract pairs of Total PCBs and Total Carbon/Total Nitrogen ratio from the high-resolution sediment core samples for the purpose of calculating correlation coefficients or performing other data analysis. The box below summarizes the steps and Figure 3-11 indicates the table links needed to accomplish the database query.

1. Move to the appropriate directory (*PHASE2\HRCORES*).

2. Select from **NONPCBS** all samples whose carbon to nitrogen ratio (C/N) is greater than 0.

3. Link through the **TAMS ID** and **TAMS Type** fields and select all the Total PCBs records from **PCBS**. (In this case, **Value2** has been selected to reflect the application of USEPA guidance regarding treatment of non-detected congener results.)

4. Save merged results to a table and export to a statistics program.

Example results are shown below (partial listing):

TAMS Sample ID	TAMS SampType	C/N - molar	Total PCBs - g/Kg DW*
HR-001-0002	P	13.60	534.35
HR-001-0204	P	12.60	950.00
HR-001-0406	P	12.50	902.37
HR-001-0608	P	13.30	1037.47
HR-001-0812	P	14.00	974.78
HR-001-1216	P	14.30	1191.13
HR-001-1620	P	15.80	1441.25
HR-001-2024	P	16.00	191.76
HR-001-2428	P	14.90	62.36
HR-001-2832	P	14.40	90.07
HR-001-3236	P	13.70	279.38
HR-001-3640	P	14.00	89.11
HR-001-4044	P	12.60	49.81

* The actual values may be different from those shown here.

The merged results can now be saved to a computer file for input to a statistics program for determining correlation coefficients.

2. Extract Homologue Sums and Core Depth Intervals for High-Resolution Sediment Core Number 19 for Graphing a Depth Profile.

This example query extracts homologue sums for sediment samples taken from core number 19 and pairs the results with core depth intervals for the purpose of generating a sediment profile. Figure 3-12 shows the table links.

1. Move to the appropriate directory (*PHASE2\HRCORES*).
2. Select from **STATIONS** all samples from station "HR-019" and link through the **TAMS ID** and **TAMS Type** fields to **PCBS**.
3. Input the criteria so as to exclude all congener records (those starting with "BZ") and include homologue sums only. (As above, **Value2** has been selected to reflect the application of USEPA guidance regarding treatment of non-detected congener results.)
4. Save merged results to a table and display.

Results displayed in a summary format are as follows:

Upper Depth (cm)	Lower Depth (cm)	Mono*	Di*	Tri*	Tetra*	Penta*	Hexa*	Hepta*	Octa*	Nona*	Deca*
0	2	2837.0	6652.9	8146.4	5284.7	2032.7	378.6	128.4	32.2	7.3	0.0
2	4	4152.0	10410.4	10544.0	5070.9	1788.3	400.4	148.1	34.3	6.3	0.0
4	6	7731.0	16086.6	14792.0	6499.0	2145.7	434.9	160.5	0.0	0.0	0.0
6	8	12160.0	27618.2	20753.5	8595.5	2680.0	632.6	222.7	38.3	8.5	0.0
8	12	43480.0	95862.0	48445.0	15893.0	3765.8	675.0	196.9	0.0	0.0	0.0
8	16	115830.0	232219.0	92503.0	23288.7	7349.2	1343.0	286.0	0.0	0.0	0.0
12	16	174150.0	238297.0	99322.7	29249.3	7986.8	823.0	0.0	0.0	0.0	0.0
16	20	616800.0	845330.0	227040.8	75873.2	27533.4	4947.0	1589.0	0.0	0.0	0.0
20	24	777750.0	1045244.0	263233.6	82505.9	26362.6	3441.0	1101.0	0.0	0.0	0.0
24	28	185810.0	196751.0	61967.6	24304.9	7443.0	1781.0	165.0	0.0	0.0	0.0
28	32	161340.0	261007.0	75486.4	23170.9	7101.2	3562.8	1423.6	557.9	222.0	0.0
32	36	38080.0	53766.0	26134.6	8872.6	3607.0	1188.0	0.0	0.0	0.0	0.0
36	40	2801.3	5483.9	1589.9	633.8	501.8	126.6	15.0	0.0	0.0	0.0
40	44	7.9	12.6	39.5	18.4	6.4	1.9	.4	0.0	0.0	0.0
44	48	9.5	9.0	31.2	24.0	11.5	1.8	.7	0.0	0.0	0.0
48	52	5.4	7.2	14.6	9.3	4.8	.9	.7	0.0	0.0	0.0
52	56	8.0	7.4	17.9	13.0	7.4	1.5	1.0	0.0	0.0	0.0
56	61	2.1	3.9	15.1	7.5	4.2	.7	.4	0.0	0.0	0.0

* The actual values may be different from those shown here.

3. Extract Five PCB Congeners from Water Samples Collected during Water Column

Transect 2 and Link Them to Station River Mile.

Because of the quantity of information and sheer number of congeners, it may be more suitable to investigate a few at a time. Subsets of congeners are readily extracted from the database for purposes of data analyses. This example extracts five congeners from a single transect and associates the results with river mile. Refer to Figure 3-13.

1. Move to the appropriate directory (*PHASE2\WATER*).

2. Select from **STATIONS** all samples from transect 002 and link through the **TAMS ID** and **TAMS Type** fields to **PCBW**.

3. Indicate which congeners are to be included in the extracted subset: BZ#1, BZ#12, BZ#27, BZ#41, or BZ#84. (As above, **Value2** has been selected to reflect the application of USEPA guidance regarding treatment of non-detected congener results.)

4. Save merged results to a table and display.

Example results are given below:

Station	River Mile	BZ#1*	BZ#12*	BZ#27*	BZ#41*	BZ#84*
0001	201	0.00	0.00	0.00	0.00	.01
0002	197	0.00	0.00	0.00	0.00	0.00
0003	196	.17	.12	.10	.02	.02
0004	194	.24	.07	.15	.04	.02
0005	189	11.90	.03	1.32	.08	.07
0006	181	3.73	.02	.57	.10	.10
0007	168	3.51	.02	.55	.10	.07
0008	157	2.91	.02	.61	.08	.07

* The actual values may be different from those shown here.

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Table 2-1
Studies Relating to PCB Contamination in the Hudson River[a]
Page 1 of 2

Type of Assessment	Year(s)	Location	Investigators
Sediment Surveys			
C 40-Mile Region of the Hudson River (>1,000 samples)	1976 - 1978	Fort Edward to Albany; Some Lower Hudson	NYSDEC
C Approx. 9-Mile Reach	1983	Thompson Is. Pool/Other	USEPA
C Approx. 5-Mile Reach (>2,000 samples)	1984	Thompson Is. Pool	NYSDEC
C Selected Upper & Lower Hudson Areas (Dated Core Samples)	1974 -1986	Upper and Lower Hudson	Lamont-Doherty
C Selected Upper Hudson Areas (Confirmatory Sediment Samples)	1992	Upper Hudson/ Rogers Is. to Lock 5	USEPA/TAMS
C Selected Upper and Lower Hudson Areas (28 High-Resolution Sediment Coring Sites)	1992	Upper and Lower Hudson	USEPA/TAMS
C Selected Upper and Lower Hudson Areas (20 Ecological Survey Sediment Samples)	1993	Upper and Lower Hudson	USEPA/TAMS
C Selected Upper Hudson Areas (Low-Resolution Sediment Core Samples)	1994	Upper Hudson/ Rogers Island to Lock 2	USEPA/TAMS
River Flow & Water Quality			
C River Flow (Discharge)	1908 - Present	Upper Hudson Region to Hadley	USGS
C Water Quality/Suspended Sediment/PCBs	. 1975 - Present	Hadley to Green Island	USGS
C Water Levels	1916 - Present	Upper Hudson/ Champlain Canal	NYSDOT
C Dissolved and Particulate Phase PCBs	1983	Upper Hudson	Lamont - Doherty/NYSDEC
C Dissolved and Particulate Phase PCBs	1993	Upper Hudson	USEPA/TAMS
C Total Suspended Solids	1993 - 1994	Upper Hudson	USEPA/TAMS
Fish/Biota			
C Fish Samples Prior to GE Hearings	1970 - 1975	Upper and Lower Hudson	NYSDEC, USEPA, NYSDOH

Table 2-1
Studies Relating to PCB Contamination in the Hudson River[a]

Type of Assessment	Year(s)	Location	Investigators
Fish/Biota (cont'd)			
C Fish Collection/Analysis Program	1975 - Present	Upper and Lower Hudson	NYSDEC
C Archived Fish Analysis	1978 - 1982	Upper and Lower Hudson	GE
C Macroinvertebrate	1973 - 1985	Upper and Lower Hudson	NYSDOH
C Fish and Macroinvertebrate Collection/Analysis Program	1993	Upper and Lower Hudson	USEPA/TAMS
Air			
C Air Monitoring	Late 1970s - Early 1980s	Fort Edward and Dump Sites	NYSDEC/DOH and Boyce Thompson Inst.
C Air Monitoring	1986-1987	Fort Edward Area	NYSDEC
Plant/Crop Uptake			
C Tree species/Some Crop and Forage Plants	Early 1980s	Fort Edward Area, Dump Sites, Dam Tailwater	NYSDEC/Boyce Thompson Inst.
C Perennial and Crop Plants	1984 - 1985	Hudson River/Albany Area	NYSDOH
Groundwater	1977	Dredge Spoils	NYSDEC/Weston
Baseline Remnant Deposit Containment Studies and Current GE Investigations			
C Water Column	1989 - Present	Upper Hudson Locations	GE
C Sediment	1989 - 1994	Upper Hudson Locations	GE
C Air Monitoring	1989 to Present	Remnant Deposits Area and Fort Edward	GE
C Multiplate/Biota	1989	Near Remnant Deposits	GE

Notes:
[a]Adapted from Limburg *et al*. (1986).

Table 2-2
Data Sets in the Reassessment Database Organized by Matrix
Page 1 of 2

Type of Assessment	Year(s)	Location	Investigators (*SUBDIRECTORY*)
Sediment Surveys			
C Over 40-Mile Reach (>1,000 samples)	1976 - 1978	Fort Edward to Albany; Some Lower Hudson	NYSDEC (*HISTORIC\SED*)
C Approx. 5-Mile Reach (>2,000 samples)	1984	Thompson Is. Pool	NYSDEC (*HISTORIC\SED*)
C Selected Sites (3 Cores)	1977 - 1986	Upper and Lower Hudson	Lamont-Doherty (*LDEO)*
C Selected Upper & Lower Hudson Sites	1989 - 1993	Upper Hudson Locations	GE (*GE* and *HISTORIC\SED*)
C Selected Upper Hudson Areas (Confirmatory Sediment Samples)	1992	Upper Hudson/Bakers Falls to Lock 5	USEPA/TAMS (*PHASE2\SEDIMENT*)
C Selected Upper & Lower Hudson Areas (28 High-Resolution Sediment Core Sites)	1992	Upper & Lower Hudson	USEPA/TAMS (*PHASE2\HRCORES*)
C Selected Upper & Lower Hudson Areas (20 Ecological Survey Sediment Sites)	1993	Upper & Lower Hudson	USEPA/TAMS (*PHASE2\ECO*)
C Upper Hudson Areas (Low-Resolution Sediment Core Samples)	1994	Ft. Edward to Lock 2	USEPA/TAMS (*PHASE2\SEDIMENT*)
River Flow & Water Quality			
C River Flow (Discharge)	1908 - 1993	Upper Hudson Region to Hadley	USGS (*USGS\FLOW*)
C River Flow (Discharge: Calculated)	1993	Ft. Edward to Waterford	USEPA/TAMS (*PHASE2\FLOW*)
C Champlain Canal Water Levels	1977 - 1993	Upper Hudson	NYSDOT (*NYSDOT*)
C PCB/Water/Sediment Partitioning	1986	NA	Lamont-Doherty (*LDEO*)
C Water Quality/Suspended Sediment/PCBs	. 1975 - Present	Hadley to Green Island	USGS (*USGS\WQDATA*)
C Dissolved & Particulate Phase PCBs	1993	Upper Hudson	USEPA/TAMS (*PHASE2\WATER*)
C Total Suspended Solids	1993 - 1994	Waterford Only (1993); Upper Hudson (April 1994)	USEPA/TAMS (*PHASE2\WATER*)
C Water Quality	1989 - 1994	Upper Hudson Locations	GE (*GE*)

Table 2-2
Data Sets in the Reassessment Database Organized by Matrix

Type of Assessment	Year(s)	Location	Investigators (*SUBDIRECTORY*)
Fish/Biota			
C Fish Collection/Analysis Program	1976 - 1993	Upper and Lower Hudson	NYSDEC (*HISTORIC\FISH*)
C Macroinvertebrate	1976 - 1985	Upper and Lower Hudson	NYSDOH (*HISTORIC\MACROINV*)
C Archived Fish Analysis	1978 - 1982	Upper Hudson	GE (*GE*)
C Fish & Macroinvertebrate Collection/Analysis Program	1993	Upper and Lower Hudson	TAMS/USEPA (*PHASE2\ECO*)
C Multiplate/Biota	1989	Near Remnant Deposits	GE (*GE*)
C Supplementary Fish Analysis (to the Ecological Program)	1993	Upper and Lower Hudson	NOAA (*NOAA*)

Table 2-3
Data Sets in the Reassessment Database Organized by Directory

Data Sets in the *HISTORIC* Directory of the Interim Database Release

Type of Assessment	Year(s)	Location	Investigators (*SUBDIRECTORY*)
Sediment Surveys			
C 40-Mile Region of the Hudson River (>1,000 samples)	1976 - 1978	Fort Edward to Albany; Some Lower Hudson	NYSDEC (*HISTORIC\SED*)
C Approx. 5-Mile Reach (>2,000 samples)	1984	Thompson Is. Pool	NYSDEC (*HISTORIC\SED*)
C Sediment - Selected Hudson River Sites	1989 - 1991	Upper Hudson Locations	GE (*HISTORIC\SED*)[1]
Fish/Biota			
C Fish Collection/Analysis Program	1973 - 1993	Upper and Lower Hudson	NYSDEC (*HISTORIC\FISH*)
C Macroinvertebrate	1973 - 1985	Upper and Lower Hudson	NYSDOH (*HISTORIC\MACROINV*)

[1] GE data can be found in the GE89 as well as the other files in this subdirectory.

Data Sets in the *GE* Directory

Type of Assessment	Year(s)	Location	Investigators (*SUBDIRECTORY*)
Baseline Remnant Deposit Containment Studies and Current GE Investigations			
C Suspended Solids/PCBs	1989 - 1994	Upper Hudson Locations	GE (*GE*)
C Sediment - Selected Hudson River Sites	1991 - 1993	Upper Hudson Locations	GE (*GE*)
C Multiplate/Biota	1989 - 1992?	Near Remnant Deposits	GE (*GE*)
C Archived Fish Samples - Selected Hudson River Sites	1978-1982	Upper and Lower Hudson	GE (*GE*)

Table 2-3
Data Sets in the Reassessment Database Organized by Directory
Page 2 of 3

Type of Assessment	Year(s)	Location	Investigators (*SUBDIRECTORY*)
River Flow & Water Quality			
C River Flow (Discharge)	1908 - 1993	Upper Hudson Region to Hadley	USGS (*USGS\FLOW*)
C Water Quality/Suspended Sediment/PCBs	.1975 - 1994	Hadley to Green Island	USGS (*USGS\WQDATA*)

Data Sets in the *LDEO* Directory

Type of Assessment	Year(s)	Location	Investigators (*SUBDIRECTORY*)
Sediment Surveys			
C Selected Hudson Sites (3 Cores)	1977 - 1986	Upper and Lower Hudson	Lamont-Doherty (*LDEO*)
River Flow & Water Quality			
C PCB Sediment/Water Partitioning	1986	NA	Lamont-Doherty (*LDEO*)

Data Sets in the *NOAA* Directory

Type of Assessment	Year(s)	Location	Investigators (*SUBDIRECTORY*)
Fish/Biota			
C Supplementary Fish Analysis (to the Phase 2 Ecological Program)	1993	Upper and Lower Hudson	NOAA *(NOAA)*

Data Sets in the *NYSDOT* Directory

Type of Assessment	Year(s)	Location	Investigators (*SUBDIRECTORY*)
River Flow & Water Quality			
C Champlain Canal Water Levels	1975 - 1993	Upper Hudson	NYSDOT (*NYSDOT*)

Table 2-3
Data Sets in the Reassessment Database Organized by Directory

Data Sets in the *PHASE 2* Directory

Type of Assessment	Year(s)	Location	Investigators (*SUBDIRECTORY*)
Sediment Surveys			
C Selected Upper Hudson Areas (Confirmatory Samples)	1992	Upper Hudson/Bakers Falls to Lock 5	USEPA/TAMS (*PHASE2\SEDIMENT*)
C Selected Upper Hudson Areas (Low Resolution Coring)	1994	Upper Hudson/Ft. Edward to Lock 2	USEPA/TAMS (*PHASE2\SEDIMENT*)
C Selected Upper and Lower Hudson Sites (28 High Resolution Sediment Core Sites)	1992	Upper and Lower Hudson	USEPA/TAMS (*PHASE2\SEDIMENT*)
C Selected Ecological Program Sampling Areas	1993	Upper and Lower Hudson	USEPA/TAMS (*PHASE2\ECO*)
River Flow and Water Quality			
C Total Suspended Solids and Suspended Organic Matter	1993 - April 1994	Waterford (1993) Upper Hudson (April 1994)	USEPA/TAMS (*PHASE2\WATER*)
C Dissolved and Particulate Phase PCBs	1993	Upper Hudson	USEPA/TAMS (*PHASE2\WATER*)
C River Flow (Discharge: Calculated)	1993	Upper Hudson	USEPA/TAMS (*PHASE2\FLOW*)
Fish/Biota			
C Fish and Macroinvertebrates Collection/Analysis Program	1993	Upper and Lower Hudson	USEPA/TAMS (*PHASE2\ECO*)

Table 2-4
Sediment Sample Inventory From the
1984-1985 NYSDEC Hudson River Survey

Sediment Samples

	Hudson River Reassessment Database			Reported by Brown et. al, 1988		
	Grab Samples Sites	**Cores Sites**		**Grab Samples Sites**	**Core Sites**	
Original Sites	675[1]	408		607	407	
Co-Located Samples	23	1				
Field Relocates	6					
Total Sites	704	409[2]		607	407	
Field Duplicates[3]	29	25				
Total Samples	733	1315[4]		607	1312[4]	
Total Sample Records			2048			1919

PCB Analyses

	No. of Analyses			No. of Analyses
	Grab Samples	**Core Samples**	**All Samples**	
GC/MS Result only	445	594	1039	628
GC/ECD Result only	14	415	429	457
GC/ECD and GC/MS Result	274	223	497	497
Total Reported Analyses	733	1232	1965[5]	1582

[1] Two sites had no reported coordinates.
[2] Two cores were not run for PCB analysis.
[3] Field duplicates represent duplicate samples, not duplicate sampling sites and therefore are not included in the site summary.
[4] On average, three samples were obtained from each core.
[5] 83 if the samples in the Reassessment database have no reported PCB result.

Table 2-5
USGS Flow Monitoring Stations

Station	Station No.	River Mile	Period of Record in the Database	Drainage Area at Station (mi^2)	Comments
Hudson River					
Hudson River at Hadley	01318500	-230	1976-1993	1,664	
Hudson River Near Corinth Below the Sacandaga River		-225	1921-1993	-2,719	Created by summing flows measured at Hudson River at Hadley and at Sacandaga River near Stewarts Bridge
Hudson River at Fort Edward	01327750	194.5	1976-1993	2,817	
Hudson River at Schuylerville	01329650	181	1977-1979	3,440	
Hudson River at Stillwater	01331095	168	1977-1993	3,773	[1]
Hudson River at Waterford	01335754	160	1976-1993	4,611	[1]
Hudson River at Green Island	01358000	154	1946-1993	8,090	[2]
Tributaries					
Sacandaga River at Stewarts Bridge	01325000	NA	1907-1993	1,055	
Batten Kill at Battenville	01329500	NA	1922-1968	394	
Hoosic River near Eagle Bridge	01334500	NA	1910-1993	510	
Mohawk River	01357500	NA	1917-1993	3,456	

[1] Data for these stations during 1993 were qualified as estimated by the USGS. For the Phase2 investigation, flows at these stations were estimated from Ft. Edward flows and NYSDOT Champlain Canal Water Levels. See the Phase2/Flow subdirectory for 1993 data for these stations.

[2] Data for this station during 1993 were qualified as estimated by the USGS.

Table 2-6
USGS Water Quality Monitoring Stations

Station	Station No.	River Mile	Period of Record in the Database	General Water Quality Period	PCB Period of Record	Comments
Corinth	01325420	-218	1973-1990	1973-1990	--	No data 1975-1985
Glens Falls	01327600		1975-1983	1974-1979	1977-1983	Intended to provide background levels of PCBs
Rogers Island at Fort Edward	01327755	194.2	1975-1993	1975-1994	1976-1994	Samples are composites of the east and west channels
Near Fort Miller	01328730	187	1986-1990	1986-1990	1986-1989	
Schuylerville	01329650	181	1976-1990	1976-1990	1977-1989	
Stillwater	01331095	168	1974-1993	1974-1994	1976-1994	
Waterford	01335770	156.5	1969-1993	1974-1994	1975-1994	
Green Island		153.9	1975-1990	1975-1990	1978-1985	Intended to represent combined Upper Hudson and Mohawk contributions to Lower Hudson

Table 2-7
Laboratories Employed in Phase 2 Chemical Analyses

Laboratory[1]	Procurement Mode[2]	Parameters
Aquatec Laboratories, Inc. Div. Inchcape Testing Services Colchester, Vermont (Aquatec)	Direct	PCBs (congener-specific) - all media TOC (sediments) TKN (sediments) Chlorophyll-*a* (water column) % Lipids (biota) Abundance and Diversity (biota)
Lamont-Doherty Earth Observatory Palisades, New York (LDEO, formerly LDGO)	Direct	Radionuclides (sediments) TC/TN (sediments) TIC (sediments) Weight Loss on Ignition (sediments) X-Ray Photography
Rensselaer Polytechnic Institute Department of Earth and Environmental Science Troy, New York (RPI)	Direct	Dissolved Organic Carbon (water column) Weight Loss on Ignition (water column) Radionuclides (sediments - assisting LDEO) Total Suspended Solids (water column)
ATEC Associates, Inc. Indianapolis, Indiana (ATEC)	SAS	Grain Size Distribution (sieve - ASTM method)
GeoSea Consulting, Ltd. British Columbia, Canada (GeoSea)	SAS and Direct	Grain Size Distribution (laser particle method)
Chemtech Consulting Group, Inc. Englewood, New Jersey (Chemtech)	SAS	Total Organic Nitrogen (sediments) Total Organic Carbon (water column) Total Suspended Solids (water column) Chlorophyll-*a* (water column)
	RAS	Metals (sediments)
Midwest Laboratories, Inc. Omaha, Nebraska (Midwest)	Direct	Grain Size Distribution (sieve - ASTM method)
Cemeic Corporation Narragansett, Rhode Island (Ceimic)	Direct	Total Organic Carbon (water column suspended matter) Total Suspended Solids (water column)
Ohio State University Columbus, Ohio (OSU)	SAS	Grain Size Distribution (laser particle method)
Saint John's University Department of Biology Jamaica, New York (SJU)	Direct	Sorting (biota)
B&W Nuclear Environmental Services, Inc. Nuclear Environmental Laboratories Lynchburg, Virginia and Leechburg, Pennsylvania (B&W)	Direct	Radionuclides (sediments)

[1] Laboratory abbreviation given in parentheses.
[2] RAS - Routine Analytical Services through the USEPA CLP.
SAS - Special Analytical Services through the USEPA CLP.
Direct - Directly procured by TAMS/Gradient outside the USEPA CLP.

Table 2-8
Water-Column Transect, Flow-Averaged Sampling and Suspended Solids Monitoring Stations

Station No.	Station Type[1]	Location	River Mile[2]	Abbreviation	Alternate Reference[3]
1	T	Glens Falls	199.5	GF	GF Public Works
2	T,F,S	Fenimore Bridge	197.6	FB	Baker Falls Bridge, Hudson Falls, Bakers Falls
3	T	Remnant Deposits	195.5	RMNTS	Remnant Deposit 2
4	T,F,S	Rt 197	194.6	RT 197	Rogers Island, Fort Edward, USGS WQ Sta. 01327755
5	T,F,S	Thompson Island Dam	188.5	TID	Crockers Reef Dam
6	T,S	Schuylerville	181.3	SCHYLER	Rt. 29 Bridge (Below Batten Kill Confluence), USGS WQ Sta. 13229650
7	T,S	Stillwater	168.3	SW	Rt. 67 Bridge (Above Hoosic River Confluence), USGS WQ Sta. 01331095
8	T,F,S	Waterford	156.5	WTFD	Rt. 4 Bridge at Waterford, USG WQ Sta. 01335770
9	T	Saratoga Springs	NA	SS	Orenda Spring at Saratoga Park
10	T	Lock 7	193.7	LOCK 7	Canal above Lock 7
11	T,S	Batten Kill	NA	BK	Approximately 1.1 miles upstream from Confluence (RM 182.1)
12	T,S	Hoosic River	NA	HOOS	Approximately 1.8 miles from Confluence (RM 167.5)
13	T,S	Mohawk River	NA	MOH	Near USGS WQ Sta. 01357500 approximately 1.8 miles from confluence (RM 156.2)
14	T,S	Green Island Bridge	151.7	GIB	Troy, Green Island Dam, USGS WQ Sta. 01358000
15	T	Coxsackie	125	COS	
16	T	Cementon	110	CEM	
17	T	Highland	77	HIGH	
19	T,S	Mechanicville	165.4	MECH	Mechanicville Public Dock
20	S	Thomson at Lock 5 Bridge			
21	S	Coveville (shore)			
22	S	Thompson Island Pool above Snook Kill			
23	S	Snook Kill	NA		
24	S	Moses Kill	NA		
25	S	Thompson Island Pool at McDonald Dock			
26	S	Lock 2			
40	S	River Road near Coveville			

[1] T - Transect Sampling Station
F - Flow-Averaged Sampling Station
S - Suspended Solids Monitoring Station

[2] Water-column transect and flow-averaged station river mile values are estimated to be accurate to within a quarter mile.

[3] Correspondence to USGS stations is approximate but should be more than sufficient for water-column data analysis. NYSDEC primary collection sites for fish are River Miles 153 and 175.

Table 2-9
Water-Column Transect, Flow-Averaged Sampling and Suspended Solids Monitoring Dates

Sampling Event		Sampling Date
Transect 1		January 29 - February 6, 1993
Transect 2		February 19 - February 22, 1993
Transect 3		March 26 - March 31, 1993
Transect 4		April 12 - April 14, 1993
Transect 5		June 24 - June 30, 1993
Transect 6		August 19 - September 1, 1993
Transect 8		April 23, 1993
Flow-Average 1		April 23 - May 8, 1993
	A1[1]	April 23, 25, 27, 28, 1993
	A2[1]	May 1, 3, 5, 7, 1993
Flow-Average 2		May 12 - May 27, 1993
Flow-Average 3		June 6 - June 19, 1993
Flow-Average 4		July 6 - July 20, 1993
Flow-Average 5		August 2 - August 17, 1993
Flow-Average 6		September 9 - September 23, 1993
Flow-Average 7	C1[2]	December 10, 1992 - January 21, 1993
	C2[2]	February 5 - February 18, 1993
	C3[2]	February 25 - March 25, 1993
	C4[2]	April 2 - April 8, 1993
Suspended Solids Monitoring, Study No. 1		April 5, 1993 - October 24, 1993
High Flow Suspended Solids Monitoring, Study No. 2		March 26, 1994 - April 27, 1994

[1] Two samples were taken at the Waterford Station. during this event. Each sample represents an 8-day sampling period.

[2] These samples represent weekly temporal composite samples collected at Waterford during the time periods listed.

Table 2-10
Ecological Sampling Stations

STATION NUMBER	RIVER MILE	SAMPLE TYPE
01	A 203.3	SEDIMENT, FISH
	B 203.6	FISH
	C 204.7	FISH
02	194.1	SEDIMENT, FISH
03	191.5	SEDIMENT, FISH
04	A 190.3	FISH
	B 190.0	FISH
	C 189.6	SEDIMENT, BENTHIC INVERTEBRATES, FISH
05	189.0	SEDIMENT, BENTHIC INVERTEBRATES
06	188.7	SEDIMENT, BENTHIC INVERTEBRATES
07	188.5	SEDIMENT, BENTHIC INVERTEBRATES
08	A 169.5	SEDIMENT
	B 169.2	FISH
09	159.0	SEDIMENT, FISH
10	143.5	SEDIMENT, FISH
11	A 137.2	SEDIMENT
	B 136.7	FISH
12	A 122.7	FISH
	B 122.4	SEDIMENT, BENTHIC INVERTEBRATES
13	113.8	SEDIMENT, FISH, BENTHIC INVERTEBRATES
14	100.0	SEDIMENT, FISH, BENTHIC INVERTEBRATES
15	A 89.4	FISH
	B 88.9	SEDIMENT, BENTHIC INVERTEBRATES
16	58.7	SEDIMENT, FISH, BENTHIC INVERTEBRATES
17	47.3	SEDIMENT, FISH, BENTHIC INVERTEBRATES
18	25.8	SEDIMENT, FISH, BENTHIC INVERTEBRATES
20	196.9	SEDIMENT, FISH

Table 3-1
Data Dictionary for Table HIST_LUT in *HISTORIC* Directory

Field Name **Paradox**	**Field Name** **FoxPro**	**Field Type [1]**	**Description**
Fld_Param	[2]	A15	Contains all field name and parameters in ***HISTORIC*** Directory
Field Type	field_type	A3	[1]
Matrix	[2]	A30	Sample matrix
Units	[2]	A10	Units of result
Description	descriptio	A100	Definition of given field name or parameter
Database File	database_f	A50	Database files that contain given field or parameter
Memo	[2]	M	Additional information for certain fields/parameters

[1] A: character field with number denoting size of field
D: date field
N: number field
M: memo field

[2] Same as Paradox

Table 3-2
Data Dictionary for Table PARAMKEY in *HISTORIC* Directory

Field Name **Paradox**	**Field Name** **FoxPro**	**Field Type [1]**	**Description**
Parameter code	parameter_0	A2	Parameter code
Parameter	parameter_1	A20	Name of parameter

[1] A: character field with number denoting size of field
D: date field
N: number field
M: memo field

Table 3-3
Tables in *HISTORIC\SED* Subdirectory

Table	Description
SAMPLES	Sediment sampling information; NYSDEC/OBG (1976 - 1978); NYSDEC/NYSDOH (1984 - 1985); GE/Harza (1990)
STATIONS	NYSDEC or GE station number correspondence to GradNo sample identifier
GRADNUMS	Core section correspondence to GradNo sample identifier
SECTION	Section number, depths, and correspondence to GradNo for sediment cores
REACHES	River reach numbers
CONCSED	PCB Aroclor data - sediment samples
NONCHEM	Non-PCB data - sediment samples
SOXHDUP	Duplicate PCB Aroclor data using soxhlet extraction
NONDETS	Key to non-detection qualifier codes
REF	Key to references used in building the database
TEXTURES	Sediment description key
GE89	Preliminary 1989 GE sediment baseline studies: GE/Harza (1989)
MASSPEC	Results for GMS performed for sediments collected during 1984-1985 NYSDEC survey of Upper Hudson

Table 3-4
Data Dictionary for Tables SAMPLES in *HISTORIC\SED* Subdirectory

Field Name **Paradox**	**Field Name** **FoxPro**	**Field Type [1]**	**Description**
GradNo	gradientx	A5	Unique identifying number
Dup	dupx	A2	Duplicate marker field (not used)
Sample Type	sample_typ	A2	Sample Type (C = core, G = Grab)
Mo	month	A2	Sample month
Dy	day	A2	Sample day
Yr	year	A4	Sample year
Rmile	river_mile	N	Hudson River mile measured from the Battery
Distance ft	distancex	N	Distance from shore in feet
Northing ft	northingx	N	NY State Plane northing coordinate
Easting ft	easting__f	N	NY State Plane easting coordinate
Sampler	[2]	N	Sampling equipment
Water Depth ft	water_dept	N	Water depth in feet
Elevation ft	elevationx	N	Surface elevation in feet

[1] A: character field with number denoting size of field
D: date field
N: number field
M: memo field

[2] Same as Paradox

Table 3-5
Data Dictionary for Table STATIONS in *HISTORIC\SED* Subdirectory

Field Name **Paradox**	**Field Name** **FoxPro**	**Field Type [1]**	**Description**
GradNo	gradientx	A5	Unique identifying number
StationNo	stationx	A4	Station identifier for reference to NYSDEC or GE files

[1] A: character field with number denoting size of field
D: date field
N: number field
M: memo field

Table 3-6
Data Dictionary for Table GRADNUMS in *HISTORIC\SED* Subdirectory

Field Name **Paradox**	**Field Name** **FoxPro**	**Field Type [1]**	**Description**
GradNo	gradientx	A5	Unique identifying number
SectionNo	sectionx	N	Core section number
IdentifierNo	identifier	A10	Identifier for reference to NYSDEC or GE files
Agency	[2]	A10	Agency collecting the data
Ref	refx	N	Reference number identifying source of data

[1] A: character field with number denoting size of field
D: date field
N: number field
M: memo field

[2] Same as Paradox

Table 3-7
Data Dictionary for Table SECTION in *HISTORIC\SED* Subdirectory

Field Name **Paradox**	**Field Name** **FoxPro**	**Field Type [1]**	**Description**
GradNo	gradientx	A5	Unique identifying number
SectionNo	sectionx	N	Core section number
Upper Depth inches	upper_dept	N	Top of core depth interval in inches
Lower Depth inches	lower_dept	N	Bottom of core depth interval in inches

[1] A: character field with number denoting size of field
D: date field
N: number field
M: memo field

Table 3-8
Data Dictionary for Table REACHES in *HISTORIC\SED* Subdirectory

Field Name **Paradox**	**Field Name** **FoxPro**	**Field Type [1]**	**Description**
Reach	[2]	N	Reach number
Lower Rmile	lower_rmil	N	Downstream endpoint river mile
Upper Rmile	upper_rmil	N	Upstream endpoint river mile

[1] A: character field with number denoting size of field
D: date field
N: number field
M: memo field

[2] Same as Paradox

Table 3-9
Data Dictionary for Table CONCSED in *HISTORIC\SED* Subdirectory

Field Name **Paradox**	**Field Name** **FoxPro**	**Field Type [1]**	**Description**
GradNo	gradientx	A5	Unique identifying number
Dups	[2]	A2	Duplicate marker field (not used)
SectionNo	sectionx	N	Core section number
Parameter	[2]	A20	Parameter name (Aroclor)
Extraction Method	extraction	A10	Extraction method code: shaker or soxhlet
Value	[2]	N	Positive numerical result
Det Limit	det_limit	N	Sample quantitation limit reported for non-detected result
Value and Limit Units	value_and	A3	Units of result or quantitation limit
Det?	detx	A3	Data qualifier (blank means detected; refer to NONDETS)

[1] A: character field with number denoting size of field
D: date field
N: number field
M: memo field

[2] Same as Paradox

Table 3-10
Data Dictionary for Table NONCHEM in *HISTORIC\SED* Subdirectory

Field Name **Paradox**	**Field Name** **FoxPro**	**Field Type [1]**	**Description**
GradNo	gradientx	A5	Unique identifying number
Dup	[2]	A2	Duplicate marker field
SectionNo	sectionx	N	Core section number
Parameter	[2]	A20	Parameter name (Aroclor)
Value	[2]	N	Numerical result

[1] A: character field with number denoting size of field
D: date field
N: number field
M: memo field

[2] Same as Paradox

Table 3-11
Data Dictionary for Table SOXHDUP in *HISTORIC\SED* Subdirectory

Field Name **Paradox**	**Field Name** **FoxPro**	**Field Type [1]**	**Description**
GradNo	gradientx	A5	Unique identifying number
SectionNo	sectionx	N	Core section number
Parameter	[2]	A20	Parameter name (Aroclor)
Extraction Method	extraction	A10	Extraction method code: shaker or soxhlet
Value	value_and	N	Positive numerical result
Det Limit	det_limit	N	Sample quantitation limit reported for non-detected result
Value and Limit Units	value_and	A3	Units of result or detection limit
Det?	detx	A3	Data qualifier (blank means detected; refer to NONDETS)

[1] A: character field with number denoting size of field
D: date field
N: number field
M: memo field

[2] Same as Paradox

Table 3-12
Data Dictionary for Table NONDETS in *HISTORIC\SED* Subdirectory

Field Name **Paradox**	**Field Name** **FoxPro**	**Field Type [1]**	**Description**
Det Category	det_catag	A3	Non-detect code
Mass Spec Screen Categ	mass_specx	A6	Mass spectrometer (GMS) screening category
Mean Concentration, ppm	mean_conce	N	Mean concentration in the category in ppm
Value	[2]	N	Ranking of type of non-detect
Comment	[2]	A100	Comments

[1] A: character field with number denoting size of field
D: date field
N: number field
M: memo field

[2] Same as Paradox

Table 3-13
Data Dictionary for Table REF in *HISTORIC\SED* Subdirectory

Field Name **Paradox**	**Field Name** **FoxPro**	**Field Type [1]**	**Description**
Ref	[2]	N	Reference number identifying data source
Description	descriptio	A40	Descriptor of data source

[1] A: character field with number denoting size of field
D: date field
N: number field
M: memo field

[2] Same as Paradox

Table 3-14
Data Dictionary for Table TEXTURES in *HISTORIC\SED* Subdirectory

Field Name **Paradox**	**Field Name** **FoxPro**	**Field Type [1]**	**Description**
Texture#	texturex	N	Sediment texture code number
Texture	[2]	A7	Sediment texture code characters
Description	descriptio	A30	Sediment texture description

[1] A: character field with number denoting size of field
D: date field
N: number field
M: memo field

[2] Same as Paradox

Table 3-15
Data Dictionary for Table GE89 in *HISTORIC\SED* Subdirectory

Field Name **Paradox**	**Field Name** **FoxPro**	**Field Type [1]**	**Description**
Gradient#	gradientx	A5	Unique identifying number
Identifier#	identifier	A4	Identifier for reference to NYSDEC or GE files
Agency	[2]	A10	Agency collecting the data
Ref#	refx	N6.0	Reference number identifying source of data
Location	[2]	A10	Location defined as per GE documentation
Sample Date	sample_dat	D	Sample date
Parameter	[2]	A2	Parameter key as defined in PARAMKEY and HIST-LUT
Det. Lim.-ppb	det__limxx	N	Sample quantitation limit reported for non-detected limit
Det.	detx	A3	ND=non-detect; blank=detect
Concentration-ppm	concentrat	N	Concentration in ppm

[1] A: character field with number denoting size of field
D: date field
N: number field
M: memo field

[2] Same as Paradox

Table 3-16
Data Dictionary for Table MASSPEC in *HISTORIC\SED* Subdirectory

Field Name **Paradox**	**Field Name** **FoxPro**	**Field Type [1]**	**Description**
Gradient#	gradientx	A5	Unique identifying number
Dup	[2]	A2	Duplicate marker field (not used)
Section#	sectionx	N	Core section number
Mass Spec Screen Categ	mass_specx	A6	Mass spectrometer (GC/MS) screening category

[1] A: character field with number denoting size of field
D: date field
N: number field
M: memo field

[2] Same as Paradox

Table 3-17
Tables in *HISTORIC\FISH* Subdirectory

Table Name	Description
GRADNUMF	Master index to GradNo
SAMPLEF	Fish sampling information
CORRNUM	Correspondence between old and new GradNo
COMPOS	Sample information for composite samples
CONCFISH	PCB Aroclor and percent lipid data - fish samples
PREP	Key to tissue and preparation codes
SPECCODE	Key to species codes
REF	Key to references used in building the database

Table 3-18
Data Dictionary for Table GRADNUMF in *HISTORIC\FISH* Subdirectory

Field Name **Paradox**	**Field Name** **FoxPro**	**Field Type [1]**	**Description**
GradNo	[2]	A5	Unique identifying number
Labno	[2]	A11	Laboratory identifier for reference to the NYSDEC files
Tagno	[2]	A9	Tag identifier for reference to the NYSDEC files
Ref	[2]	A10	Reference number identifying data source
Comment	[2]	M25	Memo field recording alterations to the database and cross-reference on GradNo assignments

[1] A: character field with number denoting size of field
D: date field
N: number field
M: memo field

[2] Same as Paradox

Table 3-19
Data Dictionary for Table SAMPLEF in *HISTORIC\FISH* Subdirectory

Field Name **Paradox**	**Field Name** **FoxPro**	**Field Type [1]**	**Description**
GradNo	Gradientx	A5	Unique identifying number
Location	[2]	A50	Narrative record of location
Rmile	[2]	N	Hudson River mile measured from the Battery
Yr	[2]	N	Sample year
Mo	[2]	N	Sample month
Dy	[2]	N	Sample day
Spp	[2]	A5	Species code (refer to SPECCODE)
Basin	[2]	A8	Numeric designation of watershed basin
MnLen	[2]	N	Fish length in mm (for composites, this is the mean length)
MnWgt	[2]	N	Weight in grams (for composites, this is the mean weight)
Sex	[2]	A1	Fish gender (contains F, M, U, X, and blank)
Age	[2]	A1	Fish age (contains 0-8, F, I, O, U, Y, and * and not presently positively identified)
Prep	[2]	A3	Fish tissue and preparation codes (refer to PREP)
Noincomp	[2]	N	Number of fish in composites
UTMN	[2]	N	NY Transverse Mercator northing
UTME	[2]	N	NY Transverse Mercator easting
Verified	[2]	A2	NSYDEC verification status (T, F, blank) although meaning of code is not presently clear

[1] A: character field with number denoting size of field
D: date field
N: number field
M: memo field

[2] Same as Paradox

Table 3-20
Data Dictionary for Table CORRNUM in *HISTORIC\FISH* Subdirectory

Field Name **Paradox**	**Field Name** **FoxPro**	**Field Type [1]**	**Description**
Oldno	[2]	A5	Old unique identifying number
Newno	[2]	A5	New unique identifying number

[1] A: character field with number denoting size of field
D: date field
N: number field
M: memo field

[2] Same as Paradox

Table 3-21
Data Dictionary for Table COMPOS in *HISTORIC\FISH* Subdirectory

Field Name **Paradox**	**Field Name** **FoxPro**	**Field Type [1]**	**Description**
GradNo	gradientx	A5	Unique identifying number
Noincomp	[2]	N	Number of individuals in composite
Mnlen	[2]	N	Mean length in composite
Minlen	[2]	N	Minimum length in composite
Maxlen	[2]	N	Maximum length in composite
Sdlen	[2]	N	Standard deviation of length
Mnwgt	[2]	N	Mean weight of individuals in composite (g)
Minwgt	[2]	N	Minimum weight in composite
Maxwgt	[2]	N	Maximum weight in composite
Sdwgt	[2]	N	Standard deviation of weight

[1] A: character field with number denoting size of field
D: date field
N: number field
M: memo field

[2] Same as Paradox

Table 3-22
Data Dictionary for Table CONCFISH in *HISTORIC\FISH* Subdirectory

Field Name **Paradox**	**Field Name** **FoxPro**	**Field Type [1]**	**Description**
GradNo	gradientx	A5	Unique identifying number
Parameter	[2]	A2	Parameter code (refer to PARAMKEY)
Value	[2]	N	Positive numeric result
Det Limit	det_or_qua	N	Sample detection limit reported for a non-detected result
Value and Limit Units	value_and	A3	Units of value or detection limit
Det or Qualifier	det_or_qu	A3	Data qualifier

[1] A: character field with number denoting size of field
D: date field
N: number field
M: memo field

[2] Same as Paradox

Table 3-23
Data Dictionary for Table PREP in *HISTORIC\FISH* Subdirectory

Field Name **Paradox**	**Field Name** **FoxPro**	**Field Type [1]**	**Description**
Abbrev	[2]	A3	Tissue or preparation code
Tissue Type	tissue_typ	A30	Type of tissue in sample

[1] A: character field with number denoting size of field
D: date field
N: number field
M: memo field

[2] Same as Paradox

Table 3-24
Data Dictionary for Table SPECCODE in *HISTORIC\FISH* Subdirectory

Field Name **Paradox**	**Field Name** **FoxPro**	**Field Type [1]**	**Description**
SPP	[2]	A5	Species code
Species	[2]	A30	Name of species in sample

[1] A: character field with number denoting size of field
D: date field
N: number field
M: memo field

[2] Same as Paradox

Table 3-25
Data Dictionary for Table REF in *HISTORIC\FISH* Subdirectory

Field Name **Paradox**	**Field Name** **FoxPro**	**Field Type [1]**	**Description**
Ref	[2]	N	Reference number identifying data source
Description	descriptio	A40	Descriptor of data source

[1] A: character field with number denoting size of field
D: date field
N: number field
M: memo field

[2] Same as Paradox

Table 3-26
Tables in *HISTORIC\MACROINV* Subdirectory

Table Name	Description
SAMPLE	Macroinvertebrate sampling information
SAMPREF	Key to sample type
NUMINDI	Number of individuals in samples
CONC	PCB Aroclor results
OTHER	Additional species included in samples
SPECCODE	Species codes
DOHSITE	Multiple and caddisfly sampling information

Table 3-27
Data Dictionary for Table SAMPLE in *HISTORIC\MACROINV* Subdirectory

Field Name **Paradox**	**Field Name** **FoxPro**	**Field Type [1]**	**Description**
GradNo	gradientx	A5	Unique identifying number
Location	[2]	A70	Location descriptor
Mo	[2]	A2	Sample month
Dy	[2]	A2	Sample day
Yr	[2]	N	Sample year
Rmile	[2]	N	River Mile measured from the Battery
Lab or EHC No	lab_or_ehc	A15	Laboratory identifier for reference to NYSDOH files
Tagno	[2]	A10	Tag identifier for reference to NYSDOH files
Species	[2]	N	Species code (refer to SPECCODE)
Sample type	sample_typ	A1	Sample type code (refer to SAMPREF)
Wet wt. (g)	wet_wt_gx	N	Sample wet weight in g
Dry wt. (g)	dry_wt_gx	N	Sample dry weight in g
Percent lipid	percent_li	N	Percent lipid content
PageNo	[2]	N	Reference page number

[1] A: character field with number denoting size of field
D: date field
N: number field
M: memo field

[2] Same as Paradox

Table 3-28
Data Dictionary for Table SAMPREF in *HISTORIC\MACROINV* Subdirectory

Field Name **Paradox**	**Field Name** **FoxPro**	**Field Type [1]**	**Description**
Sample type	sample_typ	A1	Sample type code
Note	[2]	A80	Explanation

[1] A: character field with number denoting size of field
D: date field
N: number field
M: memo field

[2] Same as Paradox

Table 3-29
Data Dictionary for Table NUMINDI in *HISTORIC\MACROINV* Subdirectory

Field Name **Paradox**	**Field Name** **FoxPro**	**Field Type [1]**	**Description**
GradNo	gradientx	A5	Unique identifying number
Number of Individuals	number_of	N	Number of individuals in sample

[1] A: character field with number denoting size of field
D: date field
N: number field
M: memo field

Table 3-30
Data Dictionary for Table CONC in *HISTORIC\MACROINV* Subdirectory

Field Name **Paradox**	**Field Name** **FoxPro**	**Field Type [1]**	**Description**
GradNo	gradientx	A5	Unique identifying number
Parameter	[2]	A20	Parameter name (Aroclor)
Value-ppm	value_ppm	N	Positive numerical result in ppm
Det Limit	det_limit	N	Sample quantitation limit reported for non-detected result
Det?	detx	A1	Denotes if sample is detected (y) or non-detected (n)

[1] A: character field with number denoting size of field
D: date field
N: number field
M: memo field

[2] Same as Paradox

Table 3-31
Data Dictionary for Table OTHER in *HISTORIC\MACROINV* Subdirectory

Field Name **Paradox**	**Field Name** **FoxPro**	**Field Type [1]**	**Description**
GradNo	[2]	A5	Unique identifying number
Other species	other_spec	N6.0	Other species number

[1] A: character field with number denoting size of field
D: date field
N: number field
M: memo field

[2] Same as Paradox

Table 3-32
Data Dictionary for Table SPECCODE in *HISTORIC\MACROINV* Subdirectory

Field Name **Paradox**	**Field Name** **FoxPro**	**Field Type [1]**	**Description**
Species	[2]	N6.0	Species code
Species Name	species_na	A20	Name of species in sample

[1] A: character field with number denoting size of field
D: date field
N: number field
M: memo field

[2] Same as Paradox

Table 3-33
Data Dictionary for Table DOHSITE in *HISTORIC\MACROINV* Subdirectory

Field Name **Paradox**	**Field Name** **FoxPro**	**Field Type [1]**	**Description**
Location	[2]	A8	Location descriptor code
Description	descriptio	A40	Description of the macroinvertebrate sampling site
Attachment	[2]	A20	Type of attachment
RMile	[2]	N	Hudson River mile measured from the Battery
Latitude	[2]	A10	Site latitude coordinate
Longitude	[2]	A10	Site longitude coordinate

[1] A: character field with number denoting size of field
D: date field
N: number field
M: memo field

[2] Same as Paradox

Table 3-34
Data Dictionary for Table USGS_LUT in *USGS* Directory

Field Name **Paradox**	**Field Name** **FoxPro**	**Field Type [1]**	**Description**
Field Name	field_name	A30	Listing of all field names in ***USGS*** Directory
Field Type	field_type	A3	[1]
Description	descriptio	A100	Definition of given field name
Database File	database_x	A50	Database file(s) which contain given field name
Memo	[2]	M	Additional information for certain field names

[1] A: character field with number denoting size of field
D: date field
N: number field
M: memo field

[2] Same as Paradox

Table 3-35
Tables in *USGS\FLOW* Subdirectory

Table Name	Description
FTEDWD	Mean daily Hudson River flow at Fort Edward, 1976-1993
GREEN	Mean daily Hudson River flow at Green Island, 1946-1993
HADLEY	Mean daily Hudson River flow at Hadley, 1921-1993
CORINTH	Mean daily Hudson River flow below Sacandaga River near Corinth, 1921-1993
SCHU	Mean daily Hudson River flow at Schuylerville, 1977-1979
STILL	Mean daily Hudson River flow at Stillwater, 1977-1979
WATR	Mean daily Hudson River flow at Waterford, 1976-1993
BATK	Mean daily Batten Kill flow at Battenville, 1922-1968
HOOS	Mean daily Hoosic River flow near Eagle Bridge, 1910-1993
SACAND	Mean daily Sacandaga River flow at Stewarts Bridge, 1907-1993
MOHK	Mean daily Mohawk River flow, 1917-1993
USGS7693	Mean daily flow at all above stations, except Battenville, 1976-1993

Table 3-36
Data Dictionary for All Tables in *USGS\FLOW* Subdirectory

Field Name **Paradox**	**Field Name** **FoxPro**	**Field Type [1]**	**Description**
Year	[2]	N	Measurement year
Month	[2]	N	Measurement month
Day	[2]	N	Measurement day
Flow_day	[2]	N	Sequential numbered day starting October 1 and ending September 30
Flow	[2]	N	Flow rate
Flow_units	[2]	A8	Flow rate units (cubic feet per second)
Station	[2]	A12	Station name

[1] A: character field with number denoting size of field
D: date field
N: number field
M: memo field

[2] Same as Paradox

Table 3-37
Tables in *USGS\WQDATA* Subdirectory

Table Name	Description
USGSWQ	Water-column PCB, suspended sediment data, and sediment load, in tons/day, collected by the USGS
TOCDAT	Water-column total organic carbon (TOC) collected by the USGS

Table 3-38
Data Dictionary for Table USGSWQ in *USGS\WQDATA* Subdirectory
Page 1 of 2

Field Name **Paradox**	**Field Name** **FoxPro**	**Field Type [1]**	**Description**
Station Name	station_na	A15	USGS Station Name
Sample Date	sample_dat	D	Sample date
Year	[2]	N	Sample year
Month	[2]	N	Sample month
Day	[2]	N	Sample day
Hour	[2]	N	Sample hour
Min	[2]	N	Sample minute
Inst. Discharge	inst_disc	N	Instantaneous discharge in units of cubic feet per second (cfs)
PCB Total	pcb_total	N	Total PCB value (ug/L)
PCB Dissolved	pcb_dissol	N	Dissolved PCB value (ug/L)
Suspended Sed	suspended	N	Total suspended sediment value (mg/L)
Key 2	key_2	N	1 indicates Total PCB value is below minimum detection limit
Key 3	key_3	N	1 indicates Dissolved PCB value is below minimum detection limit
Fines	[2]	N	Percent less than 0.062 mm
Sediment Load	sediment_l	N	Sediment load in tons/day
Aro1016	[2]	N	Aroclor 1016, in µg/L
Aro1016-ND	aro1016_nd	N	Aroclor 1016 - non-detect flag
Aro1221	[2]	N	Aroclor 1221, in µg/L
Aro1221-ND	aro1016_nd	N	Aroclor 1221 - non-detect flag
Aro1232	[2]	N	Aroclor 1232, in µg/L
Aro1232-ND	aro1232_nd	N	Aroclor 1232 - non-detect flag
Aro1242	[2]	N	Aroclor 1242, in µg/L
Aro1242-ND	aro1242_nd	N	Aroclor 1242 - non-detect flag
Aro1248	[2]	N	Aroclor 1248, in µg/L
Aro1248-ND	aro1248_nd	N	Aroclor 1248 - non-detect flag
Aro1254	[2]	N	Aroclor 1254, in µg/L

Table 3-38
Data Dictionary for Table USGSWQ in *USGS\WQDATA* Subdirectory
Page 2 of 2

Field Name **Paradox**	**Field Name** **FoxPro**	**Field Type [1]**	**Description**
Aro1254-ND	aro1254_nd	N	Aroclor 1254 - non-detect flag
Aro1260	[2]	N	Aroclor 1260, in µg/L
Aro1260-ND	aro1260_nd	N	Aroclor 1260 - non-detect flag

[1] A: character field with number denoting size of field
D: date field
N: number field
M: memo field

[2] Same as Paradox

Table 3-39
Data Dictionary for Table TOCDAT in *USGS\WQDATA* Subdirectory

Field Name **Paradox**	**Field Name** **FoxPro**	**Field Type [1]**	**Description**
Station Name	station_na	A15	USGS Station Name
Date	[2]	D	Sample date
TOC, mg/L	toc_mg_1	N	Total organic carbon (TOC) in mg/L

[1] A: character field with number denoting size of field
D: date field
N: number field
M: memo field

[2] Same as Paradox

Table 3-40
Tables in *GE* Directory

Table Name	Description
SAMPLE	Sampling information for all GE data contained in this directory
PCB	Total PCBs data for all media
PCBHOMOL	PCB homologue data for all media
PCBCONG	PCB congener data for all media
NONPCB	Non-PCB data for all media
SPECCODE	Fish species code
PCB_LUT	Congener data glossary
GEPARAMS	Parameter abbreviations glossary
FIELD_LUT	Database field glossary

Table 3-41
Data Dictionary for Table SAMPLE in *GE* Directory
Page 1 of 2

Field Name [1] **Paradox**	**Field Name** **FoxPro**	**Field Type [2]**	**Description [3]**
NEA_file	[4]	C12	NEA file identification as reported on the PCB Congener Amount Report; "X" only means sample is a Temporal Water-Column Sample analyzed for dissolved PCBs
ID	[4]	A12	Unique identifier for environmental samples
Media	[4]	A1	Sample matrix: f=fish, w=water, a=air, b=biota, p=pore water, s=sediment, blank was assigned u=unknown
NEA_Desc	[4]	A40	NEA file description as reported on PCB summary report sheet
NEA_Com	[4]	A40	NEA comment as reported on PCB summary report sheet
Location	[4]	A10	Sample location
CP->Location	cp__locati	A25	Sample location from CP031194.DBF
CP->Mix_type	cp_mix_ty	A1	Type of mixed peak deconvolution as reported on the PCB congener amount report
Invest	[4]	A3	Organization that collected the sample
Lab	[4]	A8	Laboratory that performed the analysis
Customer	[4]	A20	Customer identification as reported on the PCB summary report sheet
Program	[4]	A20	Sampling program
Date_col	[4]	D	Sample date
St_dpth	[4]	N	Depth of top of sediment core (cm) or composite water sample (ft)
End_dpth	[4]	N	Depth of bottom of sediment core (cm) or composite water sample (ft)
Tot_diss	[4]	A1	Denotes total or dissolved (derived from a filtered water sample)
Desc	[4]	A150	Sample description
CP->Reach	cp__reach	A20	Hudson River reach where sediment samples were collected
CP->Sampsed	cp__sampse	A20	Sediment sample texture and ordinal descriptor

Table 3-41
Data Dictionary for Table SAMPLE in *GE* Directory
Page 2 of 2

Field Name [1] **Paradox**	**Field Name** **FoxPro**	**Field Type [2]**	**Description [3]**
Northing	[4]	N	1927 NY State Plane northing in ft (estimated for Temporal Water Column Sampling Program)
Easting	[4]	N	1927 NY state plane easting in ft (estimated for Temporal Water Column Sampling Program)
Elev	[4]	N	River elevation (estimated for Temporal Water Column Sampling Program)
Mile	[4]	N	River Mile designation (estimated at confluent for Batten Kill and Hoosic River Temporal Water Column Sampling locations; estimated for Float Survey sampling location; estimated at the midpoint of each of the sampling reaches for the Sediment Survey)
Hrcol	[4]	N	Sample hour
Mincol	[4]	N	Sample minute
GE->Verified	ge__verifi	A3	Verified data has been checked for accuracy and validated
OBG_ID	[4]	A8	O'Brien and Gere sample identification for parameters: TSS, TDS, SP_COND, TOT_ALK, TOC_F
Wtr_dpth	[4]	N	Water depth at sample location (ft)
Age	[4]	A1	Fish age in years
Len	[4]	N	Fish length in mm
Wgt	[4]	N	Fish weight in g
Sex	[4]	A1	Sex of fish: M=Male, F=Female, U=Undetermined
Spp	[4]	A4	Fish species (refer to SPECCODE)
Pclpd	[4]	N	Percent lipids
Prep	[4]	A3	Preparation method: F=Fillet, W=Whole fish, U=Unknown

[1] Fields overlapping between CP031194.DBF and GE031194.DBF are generally from GE031194.DBF unless specifically annotated with "CP->".
[2] A: character field with number denoting size of field
D: date field
N: number field
M: memo field
[3] Adapted from documentation provided by James R. Rhea, O'Brien & Gere Engineers (1994).
[4] Same as Paradox

Table 3-42
Data Dictionary for Table PCB in *GE* Directory

Field Name [1] **Paradox**	**Field Name** **FoxPro**	**Field Type [2]**	**Description [3]**
NEA_file	[4]	A12	NEA file identification as reported on the PCB Congener Amount Report; "X" only means sample is a Temporal Water Column Sample analyzed for dissolved PCBs
ID	[4]	A12	Unique sample identifier for environmental samples
Method	[4]	A20	Analysis method: Capillary Column, USGS, Webb & McCall
Col_type	[4]	A1	Column type: C=Capillary column, P=Packed column
Aroc_ID	[4]	A20	Visually identified nominal Aroclor pattern reported by NEA for Webb & McCall analyses
Parameter	[4]	A30	Parameter name
Value	[4]	N	Positive numerical result
Dl_	dlx	N	Method detection limit reported for non-detected results
Units	[4]	A5	Units of result
Ql_	qlx	A2	Data validation qualifier: J=approximate sample result, U=approximate quantitation limit, UJ=approximate the sample result and the detection limit, R=reject the sample result or the detection limit

[1] Fields overlapping between CP031194.DBF and GE031194.DBF are generally from GE031194.DBF unless specifically annotated with "CP->".

[2] A: character field with number denoting size of field
D: date field
N: number field
M: memo field

[3] Adapted from documentation provided by James R. Rhea, O'Brien & Gere Engineers (1994).

[4] Same as Paradox

Table 3-43
Data Dictionary for Table PCBHOMOL in *GE* Directory

Field Name [1] **Paradox**	**Field Name** **FoxPro**	**Field Type [2]**	**Description [3]**
NEA_file	[4]	A7	NEA file identification as reported on the PCB Congener Amount Report, "X" only means sample is a Temporal Water Column Sample Analyzed for dissolved PCBs
ID	[4]	A12	Unique sample identifier for environmental samples
Parameter	[4]	A30	Parameter name
Value	[4]	N	Numerical result
Units	[4]	A20	Units of result

[1] Fields overlapping between CP031194.DBF and GE031194.DBF are generally from GE031194.DBF unless specifically annotated with "CP->".

[2] A: character field with number denoting size of field
D: date field
N: number field
M: memo field

[3] Adapted from documentation provided by James R. Rhea, O'Brien & Gere Engineers (1994).

[4] Same as Paradox

Table 3-44
Data Dictionary for Table PCBCONG in *GE* Directory

Field Name [1] **Paradox**	**Field Name** **FoxPro**	**Field Type [2]**	**Description [3]**
NEA_file	[4]	A7	NEA file identification as reported on the PCB Congener Amount Report, "X" only means sample is a Temporal Water Column Sample Analyzed for dissolved PCBs
ID	[4]	A12	Unique sample identifier for environmental samples
Parameter	[4]	A30	Parameter name
Value	[4]	N	Numerical result
Units	[4]	A20	Units of result

[1] Fields overlapping between CP031194.DBF and GE031194.DBF are generally from GE031194.DBF unless specifically annotated with "CP->".

[2] A: character field with number denoting size of field
D: date field
N: number field
M: memo field

[3] Adapted from documentation provided by James R. Rhea, O'Brien & Gere Engineers (1994).

[4] Same as Paradox

Table 3-45
Data Dictionary for Table NONPCB in *GE* Directory

Field Name [1] **Paradox**	**Field Name** **FoxPro**	**Field Type [2]**	**Description [3]**
NEA_file	[4]	A7	NEA file identification as reported on the PCB Congener Amount Report, "X" only means sample is a Temporal Water Column Sample Analyzed for dissolved PCBs
ID	[4]	A12	Unique sample identifier for environmental samples
Parameter	[4]	A30	Parameter name
Value	[4]	N	Numerical result
Units	[4]	A20	Units of result

[1] Fields overlapping between CP031194.DBF and GE031194.DBF are generally from GE031194.DBF unless specifically annotated with "CP->".

[2] A: character field with number denoting size of field
D: date field
N: number field
M: memo field

[3] Adapted from documentation provided by James R. Rhea, O'Brien & Gere Engineers (1994).

[4] Same as Paradox

Table 3-46
Data Dictionary for Table SPECCODE in *GE* Directory

Field Name **Paradox**	**Field Name** **FoxPro**	**Field Type [1]**	**Description**
Spp	[2]	A5	Species code
Species	[2]	A30	Name of species in samples

[1] A: character field with number denoting size of field
D: date field
N: number field
M: memo field

[2] Same as Paradox

Table 3-47
Data Dictionary for Table PCB_LUT in *GE* Directory

Field Name **Paradox**	**Field Name** **FoxPro**	**Field Type [1]**	**Description**
Parameter	[2]	A11	Parameter code fr
NEA Parameter name	nea_parame	A31	Reported parameter name
Congener 1	congener_1	A45	First congener name or description
Congener 2	congener_2	A39	Second congener name if coelution
Congener 3	congener_3	A35	Third PCB congener name if coelution
Group	[2]	A7	Homologue group
BZ	[2]	A38	Corresponding BZ number

[1] A: character field with number denoting size of field
D: date field
N: number field
M: memo field

[2] Same as Paradox

Table 3-48
Data Dictionary for Table GEPARAMS in *GE* Directory

Field Name **Paradox**	**Field Name** **FoxPro**	**Field Type [1]**	**Description**
Parameter	parameter_0	A20	Database parameter abbreviation
Parameter Name	parameter_1	A60	Parameter name

[1] A: character field with number denoting size of field
D: date field
N: number field
M: memo field

Table 3-49
Data Dictionary for Table FIELD_LUT in *GE* Directory

Field Name **Paradox**	**Field Name** **FoxPro**	**Field Type [1]**	**Description**
Field Name	field_name	A15	Contains all field names in GE Directory
Field Name	field_type	A3	[1]
Description	descriptio	A100	Definition of each field name
Database File	database_f	A30	Files that contain given field
Memo	[2]	M	Additional information on field names

[1] A: character field with number denoting size of field
D: date field
N: number field
M: memo field

[2] Same as Paradox

Table 3-50
Data Dictionary for Table GAUGES in *NYSDOT* Directory

Field Name Paradox	Field Name FoxPro	Field Type [1]	Description
Year	[2]	N	Measurement year
Month	[2]	N	Measurement month
Day	[2]	N	Measurement day
Wy day	wy:day	N	Water year day
Gauge 119	gauge:119	N	Reading at staff gauge located below Lock 7 (Fort Edward) [3]
Gauge 118	gauge:118	N	Reading at staff gauge located above Crocker's Reef guard gate (Thompson Island Dam) at landcut portion of canal (near Fort Miller) [3]
Gauge 116	gauge:116	N	Reading at staff gauge located above Lock 6 (near Fort Miller) [3]
Gauge 115	gauge:115	N	Reading at staff gauge located below Lock 6 (near Fort Miller) [3]
Gauge 114	gauge:114	N	Reading at staff gauge located above Lock 5 (near Schuylerville) [3]
Gauge 113	gauge:113	N	Reading at staff gauge located below Lock 5 (near Schuylerville) [3]
Gauge 109	gauge:109	N	Reading at staff gauge located above Lock 4 (near Stillwater) [3]
Gauge 108	gauge:108	N	Reading at staff gauge located below Lock 4 (near Stillwater) [3]
Gauge 106	gauge:106	N	Reading at staff gauge located above Lock 3 (near Mechanicville) [3]
Gauge 105	gauge:105	N	Reading at staff gauge located below Lock 3 (near Mechanicville) [3]
Gauge 104	gauge:104	N	Reading at staff gauge located above Lock 2 (near Mechanicville) [3]
Gauge 103	gauge:103	N	Reading at staff gauge located below Lock 2 (near Mechanicville) [3]

[1] A: character field with number denoting size of field
D: date field
N: number field
M: memo field

[2] Same as Paradox

[3] Reading in ft., relative to NYS Barge Canal Datum.
This reading can be converted to NGVD 1929 by subtracting 1.177 ft.

Table 3-51
Data Dictionary for Table CONG_LUT in *PHASE2* Directory

Field Name **Paradox**	**Field Name** **FoxPro**	**Field Type [1]**	**Description**
BZ-No	bz_no	A3	Congener number
Parameter	[2]	A25	Contains all PCB parameters in ***PHASE2*** Directory
Homologue	[2]	A10	Classification based on number of chlorine atoms
Description	descript	A50	Definition of given PCB parameter
Conversion	[2]	A11	Correction factor see ***PHASE2*\FIELDS**
Target	[2]	A10	Yes: target congener (calibrated with standard) No: non-target congener No-cal: calibrated non-target congener Mix: congener pair coelutes
Unit_water	[2]	A8	Units for water samples, in ng/L
Unit_sed	[2]	A8	Units for sediment samples, in ug/Kg DW
Unit_part	[2]	A8	Units for particulate samples, in ug/kg DW
Subdirectory	Subdirectox	A45	***PHASE2*** Subdirectory(ies) that contain given parameters
Database	[2]	A30	Database files that contain given parameter
Comment	[2]	A100	Comments

Table 3-52
Data Dictionary for Table FIELDS in *PHASE2* Directory

Field Name **Paradox**	**Field Name** **FoxPro**	**Field Type [1]**	**Description**
Field Name	field_name	A30	Contains database field names for ***PHASE2*** Directory
Field Type	field_type	A3	[1]
Description	descriptio	A100	Definition of field name
Database File	database_f	A100	Files that contain given field name
Memo	[2]	M	Additional information for certain fields

[1] A: character field with number denoting size of field
D: date field
N: number field
M: memo field

[2] Same as Paradox

Table 3-53
Data Dictionary for Table PARAMS in *PHASE2* Directory

Field Name **Paradox**	**Field Name** **FoxPro**	**Field Type [1]**	**Description**
Parameter	[2]	A30	Contains every parameter in the ***PHASE2*** Directory
Matrix	[2]	A12	Sample matrix
Units	[2]	A15	Units of result
Description	descriptio	A100	Definition of given parameter
Subdirectory	[2]	A30	Lists ***PHASE2*** Subdirectories containing given parameter
Database	[2]	A30	Database table within subdirectories where given parameter can be found
Memo	[2]	M	Additional information for certain parameters

[1] A: character field with number denoting size of field
D: date field
N: number field
M: memo field

[2] Same as Paradox

Table 3-54
Data Dictionary for Table QUALIFY in *PHASE2* Directory

Field Name **Paradox**	**Field Name** **FoxPro**	**Field Type [1]**	**Description**
QA Comment	qa_comment	A5	Specific Quality Assurance qualifier [3]
Type	[2]	A30	Designates laboratory or data validation qualifier
Definition	[2]	M	Definition of QA Comment
Parameter Type	Parameter	A20	Parameter type for which qualifier is applicable
Assigned Qualifier	assigned_q	A5	Simplified reported qualification [3]

[1] A: character field with number denoting size of field
D: date field
N: number field
M: memo field

[2] Same as Paradox

[3] QA Comment specifies the reason for qualification, e.g., why a value is estimated, while the Assigned Qualifier designates whether the value is non-detect estimated, presumed present, or rejected.

Table 3-55
Data Dictionary for Table AROCLSTD in *PHASE2* Directory

Field Name **Paradox**	**Field Name** **FoxPro**	**Field Type [1]**	**Description**
Lab Sample ID	lab_sample	A10	Laboratory sample identifier
Sample ID	sample_id	A25	Sample identifier
Date Analyzed	date_analx	D	Data sample was analyzed
Matrix	[2]	A8	Sample matrix
Parameter	[2]	A28	Parameter name
Units	[2]	A10	Units of result
Value	[2]	N	Numerical result with non-detected values set to sample detection limit
Qualifier	[2]	A10	Data qualifier
Validated	[2]	A3	Field denoting if results have been validated (yes/no)

[1] A: character field with number denoting size of field
D: date field
N: number field
M: memo field

[2] Same as Paradox

Table 3-56
Data Dictionary for Table ASCREEN in *PHASE2* Directory

Field Name **Paradox**	**Field Name** **FoxPro**	**Field Type [1]**	**Description**
Parameter	[2]	A28	Congener
1016	[2]	N	Aroclor 1016 [3]
1221	[2]	N	Aroclor 1221 [3]
1232	[2]	N	Aroclor 12321 [3]
1242	[2]	N	Aroclor 1242 [3]
1248	[2]	N	Aroclor 1248 [3]
1254	[2]	N	Aroclor 1254 [3]
1260	[2]	N	Aroclor 1260 [3]
1016-1242	1016_1242	N	Aroclors 1016 and 1242 [3]
1221-1232	1221_1232	N	Aroclors 1221 and 1232 [3]
1016-1248-1254	1016_1248x	N	Aroclors 1016, 1248 and 1254 [3]

[1] A: character field with number denoting size of field
D: date field
N: number field
M: memo field

[2] Same as Paradox

[3] Congener is considered present in the Aroclor or sum of Aroclors when marked with a "1". Congener is absent when marked with a "0".

Table 3-57
Tables in *PHASE2\WATER* Subdirectory

Table Name	Description
STATIONS	Water column transects and flow-averaged events stations
GROUPS	Sample groupings
PCBP	PCB congeners/homologue sums/Aroclor concentrations - particulate samples (Fg/Kg)
PCBPD	PCB congeners - particulate duplicate pairs (Fg/Kg)
PCBPE	PCB congeners - particulate samples equilibration study (Fg/Kg)
PCBFA7	PCB congeners/homologue sums/Aroclor concentrations - combined particulate and dissolved samples (ng/L) for flow-averaged event 7
PCBW	PCB congeners/homologue sums/Aroclor concentrations - water samples (ng/L)
PCBWD	PCB congeners - water duplicate pairs (ng/L)
PCBWE	PCB congeners - water (dissolved) samples - equilibration study (ng/L)
PCBWTT	PCB congeners - whole water samples (TT series) (ng/L)
NONPCBW	Non-PCB data - water column samples
NONPCBWD	Non-PCB data - water duplicate sample pairs
FB	Non-PCB data - field blanks
VOLUMES	Sample volumes filtered for PCB analyses

Table 3-58
Data Dictionary for Table STATIONS in *PHASE2\WATER* Subdirectory

Field Name **Paradox**	**Field Name** **FoxPro**	**Field Type [1]**	**Description**
Transect	[2]	A5	Transect or flow-averaged sampling event number
Station	[2]	A6	Station number
TAMS ID	tams_id	A11	Sample identifier
TAMS Type	tams_type	A3	Sample type [3]
Date Sampled	date_sampl	D	Date sample was taken
Matrix	[2]	A6	Sample matrix (WATER, FILTER)
Est Easting	[2]	N	Estimated NY State Plane easting (ft)
Est Northing	[2]	N	Estimated NY State Plane northing (ft)
River Mile	river_mile	N	River mile measured from the Battery
Location	[2]	A30	Station description
Program	[2]	A3	Program abbreviation (TW, TS, TT, FW, TS) [4]
SAS No.	sas_nox	A18	Sample identifier for laboratory program
Comment	[2]	A120	Sample comment

[1] A: character field with number denoting size of field
D: date field
N: number field
M: memo field

[2] Same as Paradox

[3] B: Field blank
C: Composite
D: Duplicate
M: Miscellaneous

[4] TS: Water column transect suspended matter sample
TT: Water column transect whole (total) water sample
TW: Water column transect filtered water sample
FS: Flow-average filtered water sample
FW: Flow-average suspended matter sample

Table 3-59
Data Dictionary for Table GROUPS in *PHASE2\WATER* Subdirectory

Field Name **Paradox**	**Field Name** **FoxPro**	**Field Type [1]**	**Description**
Station	[2]	A6	Station number
Group	[2]	A25	Group identifier

[1] A: character field with number denoting size of field
D: date field
N: number field

[2] Same as Paradox

Table 3-60
Data Dictionary for Tables PCBP, PCBW, PCBFA7, PCBPE, PCBWE
in *PHASE2\WATER* Subdirectory

Field Name **Paradox**	**Field Name** **FoxPro**	**Field Type [1]**	**Description**
TAMS ID	tams_id	A11	Sample identifier
TAMS Type	tams_type	A3	Sample type [2]
Split	[2]	A10	Field denoting if record represents a composite of duplicate analyses (Avg-FD - average of field duplicates); not contained in PCBFA7, PCBPE or PCBWE.
Matrix	[2]	A8	Sample matrix (WATER, FILTER)
Parameter	[2]	A28	Parameter name
Units	[2]	A10	Units of result
Value1	[2]	N	Numerical result with non-detected values set to sample detection limit [3]; in PCBFA7, value1=value
Value2	[2]	N	Numerical result with non-detected values set to 0 or 1/2 detection limit; not contained in PCBFA7
Qualifier	[2]	A5	Data qualifier
QA Comment	qa_comment	A10	Quality Assurance comment codes see ***PHASE2*\QUALIFY**
Validated?	validated	A3	Field denoting if results have been validated (Yes/No)

[1] A: character field with number denoting size of field
D: date field
N: number field
M: memo field

[2] B: Field blank
C: Composite
D: Duplicate
M: Miscellaneous

[3] Homologue sums and Total PCBs values represent sums of detected values only.

Table 3-61
Data Dictionary for Tables PCBWTT, PCBWD, PCBPD
in *PHASE2\WATER* Subdirectory

Field Name **Paradox**	**Field Name** **FoxPro**	**Field Type [1]**	**Description**
TAMS ID	tams_id	A11	Sample identifier
TAMS Type	tams_type	A3	Sample type [2]
Matrix	[3]	A8	Sample matrix (WATER, FILTER)
Parameter	[3]	A28	Parameter name
Units	[3]	A10	Units of result
Value	[3]	N	Numerical result with non-detected values set to sample detection limit
Qualifier	[3]	A5	Data qualifier
QA Comment	qa_comment	A10	Quality assurance comment codes see ***PHASE2*\QUALIFY**
Validated	[3]	A3	Field denoting if results have been validated (Yes/No)

[1] A: character field with number denoting size of field
D: date field
N: number field
M: memo field

[2] B: Field blank
C: Composite
D: Duplicate
M: Miscellaneous

[3] Same as Paradox

Table 3-62
Data Dictionary for Tables NONPCBW, NONPCBWD in *PHASE2\WATER* Subdirectory

Field Name **Paradox**	**Field Name** **FoxPro**	**Field Type [1]**	**Description**
TAMS ID	tams_id	A11	Sample identifier
TAMS Type	tams_type	A3	Sample type [2]
SAS No.	sas_nox	A8	Sample identifier for laboratory program
Split	[3]	A10	Field denoting if record represents a composite of duplicate analyses (Avg-FD - average of field duplicates) in **NONPCBW**; Non-blank entry in **NONPCBWD** represents a laboratory duplicate anlaysis
Laboratory	[3]	A10	Name of laboratory performing analysis
SDG No.	sdg_nox	A12	Sample delivery group (for data validation)
Parameter	[3]	A30	Parameter name
Units	[3]	A10	Units of result
Value	[3]	N	Numerical result with non-detected values set to sample detection limit
Qualifier	[3]	A4	Data qualifier
Validated	[3]	A4	Field denoting if results have been validated (Yes/No)

[1] A: character field with number denoting size of field
D: date field
N: number field
M: memo field

[2] B: Field blank
C: Composite
D: Duplicate
M: Miscellaneous

[3] Same as Paradox

Table 3-63
Data Dictionary for Table FB in *PHASE2\WATER* Subdirectory

Field Name **Paradox**	**Field Name** **FoxPro**	**Field Type [1]**	**Description**
TAMS ID	tams_id	A11	Sample identifier
TAMS Type	tams_type	A3	Sample type [2]
SAS No.	sas_nox	A8	Sample identifier for laboratory program
Split	[3]	A10	Non-blank entry denotes a laboratory duplicate or split sample
Laboratory	[3]	A10	Name of laboratory performing analysis
SDG No.	sdg_nox	A12	Sample delivery group (for data validation)
Parameter	[3]	A30	Parameter name
Units	[3]	A10	Units of result
Value	[3]	N	Numerical result with non-detected values set to sample detection limit
Qualifier	[3]	A4	Data qualifier

[1] A: character field with number denoting size of field
D: date field
N: number field
M: memo field

[2] B: Field blank
C: Composite
D: Duplicate
M: Miscellaneous

[3] Same as Paradox

Table 3-64
Data Dictionary for Table VOLUMES in *PHASE2\WATER* Subdirectory

Field Name **Paradox**	**Field Name** **FoxPro**	**Field Type [1]**	**Description**
TAMSW	[2]	A11	Sample identifier - water sample
SampTypeW	[2]	A3	Sample type - water sample [3]
TAMSP	[2]	A11	Sample identifier - corresponding filtered sample
SampTypeP	[2]	A3	Sample type - corresponding filtered sample [3]
Volume Filtered	volume_fil	N	Volume filtered
Units	[2]	A4	Units of volume filtered

[1] A: character field with number denoting size of field
D: date field
N: number field
M: memo field

[2] Same as Paradox

[3] B: Field blank
C: Composite
D: Duplicate
M: Miscellaneous

Table 3-65
Tables in *PHASE2\SEDIMENT* Subdirectory

Table Name	Description
STATIONS	Confirmatory Sampling and High-Resolution Sediment Coring Program sampling stations
PCBS	PCB congeners/homologue sums/Aroclor sums - sediment samples (µg/kg DW)
PCBSD	PCB congeners - duplicate sediment sample pairs (µg/kg DW)
NONPCBS	Non-PCB data - sediment samples
NONPCBSD	Non-PCB data - duplicate sediment sample pairs
FB	Non-PCB data - field blanks
SIEVEGS	ASTM Grain size distribution data by sieve analysis
SIEVEGSD	ASTM Grain size distribution data by sieve analysis - sample duplicates
LASERGS	Grain size distribrution data by laser particle analysis
LASERGSD	Grain size distribution data by laser particle anlaysis - sample duplicates
RADNUC	Radionuclide data - sediment samples
RADNUCD	Radionuclide data - sediment samples field duplicates
LRINFO	Supplemental Low Resolution Sediment Coring Program information
SEDDESC	Descriptive sediment classifications density, redox and other field data

Table 3-66
Data Dictionary for Table STATIONS in *PHASE2\SEDIMENT* Subdirectory

Field Name **Paradox**	**Field Name** **FoxPro**	**Field Type [1]**	**Description**
Station	[2]	A8	Station number
TAMS ID	tams_id	A11	Sample identifier
TAMS Type	tams_type	A3	Sample type [3]
Date Sampled	date_sampl	D	Date sample was taken
Time Sampled	time_sampl	A10	Time sample was taken
Lower Depth (cm)	lower_dept	N	Depth of top of sediment slice (cm)
Upper Depth (cm)	upper_dept	N	Depth of bottom of sediment slice (cm)
Easting	[2]	N	NY State Plane easting (ft)
Northing	[2]	N	NY State Plane northing (ft)
Location	[2]	A30	Station description
Program	[2]	A3	Program abbreviation (HR, CS, CG) [4]
SAS No.	sas_nox	A10	Sample identifier for laboratory program
Comment	[2]	A120	Sample comment

[1] A: character field with number denoting size of field
D: date field
N: number field
M: memo field

[2] Same as Paradox

[3] A: Archive core
B: Field blank
D: Duplicate core
G: Grain-size core
M: Matrix spike sample or core
P: PCB core
X: X-Ray core

[4] CC: Confirmatory sampling core
CG: Confirmatory sampling grab
HR: High-resolution sediment core
LR: Low-resolution sediment core

Table 3-67
Data Dictionary for Table PCBS in *PHASE2\SEDIMENT* Subdirectory

Field Name **Paradox**	**Field Name** **FoxPro**	**Field Type [1]**	**Description**
TAMS ID	tams_id	A11	Sample identifier
TAMS Type	tams_type	A3	Sample type [2]
Split	[3]	A10	Field denoting if record represents a composite of duplicate analyses (Avg-FD - average of field duplicates)
Matrix	[3]	A8	Sample matrix (SED)
Parameter	[3]	A28	Parameter name
Units	[3]	A10	Units of result
Value1	[3]	N	Numerical result with non-detected values set to sample quantitation limit [4]
Value2	[3]	N	Numerical result with non-detected values set to 0 of 1/2 quantitation limit
Qualifier	[3]	A5	Data qualifier
QA Comment	qa_comment	A10	Quality Assurance comment code see *PHASE2*\QUALIFY
Validated?	validated	A3	Field denoting if results have been validated (Yes/No)

[1] A: character field with number denoting size of field
D: date field
N: number field
M: memo field

[2] A: Archive core
B: Field blank
D: Duplicate core
G: Grain-size core
M: Matrix spike sample or core
P: PCB core
X: X-Ray core

[3] Same as Paradox

[4] Homologue sums and Total PCBs values represent sums of detected values only.

Table 3-68
Data Dictionary for Tables PCBSD in *PHASE2\SEDIMENT* Subdirectory

Field Name **Paradox**	**Field Name** **FoxPro**	**Field Type [1]**	**Description**
TAMS ID	tams_id	A11	Sample identifier
TAMS Type	tams_type	A3	Sample type [2]
Matrix	[3]	A8	Sample matrix (SED)
Parameter	[3]	A28	Parameter name
Units	[3]	A10	Units of result
Value	[3]	N	Numerical result with non-detected values set to sample detection limit
Qualifier	[3]	A5	Data qualifier
QA Comment	qa_comment	A10	Quality Assurance comment code see ***PHASE2*\QUALIFY**
Validated	[3]	A3	Field denoting if results have been validated (Yes/No)
Date Sampled	date_sampl	D	Date sample was taken

[1] A: character field with number denoting size of field
D: date field
N: number field
M: memo field

[2] A: Archive core
B: Field blank
D: Duplicate core
G: Grain-size core
M: Matrix spike sample or core
P: PCB core
X: X-Ray core

[3] Same as Paradox

Table 3-69
Data Dictionary for Tables NONPCBS, NONPCBSD, SIEVEGS, SIEVEGSD, LASERGS, LASERGSD in *PHASE2\SEDIMENT* Subdirectory

Field Name **Paradox**	**Field Name** **FoxPro**	**Field Type [1]**	**Description**
TAMS ID	tams_id	A11	Sample identifier
TAMS Type	tams_type	A3	Sample type [2]
SAS No.	sas_nox	A8	Sample identifier for laboratory program
Split	[3]	A10	Field denoting if record represents a composite of duplicate analyses (Avg-FD - average of field duplicates) in **NONPCBS**; Non-blank entry in **NONPCBSD** represents a laboratory duplicate anlaysis
Laboratory	[3]	A10	Name of laboratory performing analysis
SDG No.	sdg_nox	A12	Sample delivery group (for data validation)
Parameter	[3]	A30	Parameter name
Units	[3]	A10	Units of result
Value	[3]	N	Numerical result with non-detected values set to sample detection limit
Qualifier	[3]	A4	Data qualifier
Validated	[3]	A4	Field denoting if results have been validated (Yes/No)

[1] A: character field with number denoting size of field
D: date field
N: number field
M: memo field

[2] A: Archive core
B: Field blank
D: Duplicate core
G: Grain-size core
M: Matrix spike sample or core
P: PCB core
X: X-Ray core

[3] Same as Paradox

Table 3-70
Data Dictionary for Table FB in *PHASE2\SEDIMENT* Subdirectory

Field Name **Paradox**	**Field Name** **FoxPro**	**Field Type [1]**	**Description**
TAMS ID	tams_id	A11	Sample identifier
TAMS Type	tams_type	A3	Sample type [2]
SAS No.	sas_nox	A8	Sample identifier for laboratory program
Split	[3]	A10	Non-blank entry denotes a laboratory duplicate or split sample
Laboratory	[3]	A10	Name of laboratory performing analysis
SDG No.	sdg_nox	A12	Sample delivery group (for data validation)
Parameter	[3]	A30	Parameter name
Units	[3]	A10	
Value	[3]	N	Numerical result with non-detected values set to sample detection limit
Qualifier	[3]	A3	Data qualifier

[1] A: character field with number denoting size of field
D: date field
N: number field
M: memo field

[2] A: Archive core
B: Field blank
D: Duplicate core
G: Grain-size core
M: Matrix spike sample or core
P: PCB core
X: X-Ray core

[3] Same as Paradox

Table 3-71
Data Dictionary for Tables RADNUC, RADNUCD in *PHASE2\SEDIMENT* Subdirectory

Field Name **Paradox**	**Field Name** **FoxPro**	**Field Type [1]**	**Description**
TAMS ID	tams_id	A11	Sample identifier
TAMS Type	tams_type	A3	Sample type [2]
Split	[3]	A4	Non-blank entry denotes a laboratory duplicate or split sample
Laboratory	[3]	A10	Name of laboratory performing analysis
SDG No.	sdg_nox	A5	Sample delivery group (for data validation)
Date Sampled	date_sampl	D	Date sample was taken
Counting Date	counting_d	D	Date sample was counted
Detector	[3]	A11	Detector type
Parameter	[3]	A30	Parameter name
Units	[3]	A10	Units of result
Sigma	[3]	N	Standard deviation associated with counting result
Value	[3]	N	Numerical result with non-detected values set to sample quantitation limit
Det Limit	det_limit	N	Reported counter detector limit
Qualifier	[3]	A3	Data qualifier
Validated	[3]	A4	Field denoting if results have been validated (Yes/No)

[1] A: character field with number denoting size of field
D: date field
N: number field

[2] Sample Type Categories
A: Archive core
B: Field blank
D: Duplicate core
G: Grain-size core
M: Matrix spike sample or core
P: PCB core
X: X-Ray core

[3] Same as Paradox

Table 3-72
Data Dictionary for Table LRINFO in *PHASE2\SEDIMENT* Subdirectory

Field Name **Paradox**	**Field Name** **FoxPro**	**Field Type [1]**	**Description**
TAMS ID	tams_id	A11	Sample identifier
TAMS Type	tams_type	A3	Sample type [2]
NYSDEC No.	nysdec_nox	A8	Corresponding 1984 NYSDEC Sediment Survey Station No. (from Brown et. al 1988)
Hotspot No.	hotspot_nx	A10	NYSDEC Hotspot Number

[1] A: character field with number denoting size of field
D: date field
N: number field

[2] Sample Type Categories
A: Archive core
B: Field blank
D: Duplicate core
G: Grain-size core
M: Matrix spike sample or core
P: PCB core
X: X-Ray core

Table 3-73
Data Dictionary for Table SEDDESC in *PHASE2\SEDIMENT* Subdirectory

Field Name **Paradox**	**Field Name** **FoxPro**	**Field Type [1]**	**Description**
TAMS ID	tams_id	A11	Sample identifier
TAMS Type	tams_type	A3	Sample type [2]
Eh	[3]	N	Redox potential in meV
Temperature	temperatur	N	Temperature of redox measurement in EC
Field Comment	field_comm	A50	Comments from field notes
Color_1	[3]	A5	Primary sediment coloration noted in field
Color_2	[3]	A5	Secondary sediment coloration noted in field
Sed_Clas_1	[3]	A5	TAMS descriptive sediment classification (based on ASTM method)
Sed_Clas_2	[3]	A5	TAMS descriptive sediment classification (based on ASTM method)
Sed_Clas_3	[3]	A5	TAMS descriptive sediment classification (based on ASTM method)
Sed_Clas_4	[3]	A5	TAMS descriptive sediment classification (based on ASTM method)
Sed_Clas_5	[3]	A7	TAMS descriptive sediment classification (based on ASTM method)
Description	descriptio	A120	Complete field description of sediment characteristics
Wet Weight	wet_weight	N	Wet weight of sample, in grams
Volume	[3]	N	Volume of container, in cc
Bulk Density	bulk_densi	N	Bulk density of sample, in g/cc
Percent Solids	percent_so	N	Measured percent of solids
Particle Density	particle_x	N	Particle density, in g/cc

[1] A: character field with number denoting size of field
D: date field
N: number field

[2] Sample Type Categories
A: Archive core
B: Field blank
D: Duplicate core
G: Grain-size core
M: Matrix spike sample or core
P: PCB core
X: X-Ray core

[3] Same as Paradox

Table 3-74
Tables in *PHASE2\ECO* Subdirectory

Table Name	Description
STATIONS	Ecological survey stations
COORDS	Coordinates for stations
GROUPS	Sample groupings
BENTHIC	Sample composition information - invertebrates
FISH	Sample composition information - fish
PCBFISH	PCB congeners/homologue sum/Aroclor concentrations - fish
PCBFISHD	PCB congeners - fish dup pairs/dilution analyses
PCBINV	PCB congeners/homologue sum/Aroclor concentrations - invertebrates
PCBINVD	PCB congeners - invertebrate dup. pairs/dilultion analyses
NONPCBB	Non-PCB data - biota
NONPCBBD	Non-PCB data - biota duplicate pairs
PCBS	PCB congeners/homologue sums/Aroclor concentrations - sediment samples (ug/kg DW)
PCBSD	PCB congeners - sediment duplicate pairs (ug/kg DW))
NONPCBS	Non-PCB data - sediment samples
NONPCBSD	Non-PCB data - sediment duplicate pairs
LASERGS	Sediment laser grain size data
FB	Non-PCB data - sediment field blanks
SPECIES	Key to species codes
LASERGSD	Sediment laser grain size data - duplicate pairs

Table 3-75
Data Dictionary for Table STATIONS in *PHASE2\ECO* Subdirectory

Field Name **Paradox**	**Field Name** **FoxPro**	**Field Type [1]**	**Description**
Station	[2]	A8	Station number
TAMS ID	tams_id	A11	Sample identifier
TAMS Type	tams_type	A3	Sample type [3]
Species	[2]	A4	Species code
Date Sampled	date_sampl	D	Date sample was taken
Est Easting	est_eastin	N	Estimated NY State Plane easting (ft)
Est Northing	est_northi	N	Estimated NY State Plane northing (ft)
River Mile	river_mile	N	Mile measured from the Battery
Description	descriptio	A26	Station description
Program	[2]	A3	Program abbreviation (EC) [4]
SAS No.	sas_nox	A8	Sample identifier for laboratory program
RAS No.	ras_nox	A8	Second sample identifier for laboratory program
Comment.	[2]	A120	Sample comment

[1] A: character field with number denoting size of field
D: date field
N: number field
M: memo field

[2] Same as Paradox

[3] B: Field blank
D: Duplicate sample

[4] EC: Ecological survey

Table 3-76
Data Dictionary for Table COORDS in *PHASE2\ECO* Subdirectory

Field Name **Paradox**	**Field Name** **FoxPro**	**Field Type [1]**	**Description**
Station	[2]	A16	Station name
Est Easting	[2] est_eastin	N	Estimated NY State Plane easting (ft)
Est Northing	[2] est_northin	N	Estimated NY State Plane northing (ft)
Sample Type	sample_typ	A23	Type of sample taken
Fish Type	fish_typ	A18	Type of fish taken

[1] A: character field with number denoting size of field
D: date field
N: number field
M: memo field

[2] Same as Paradox

Table 3-77
Data Dictionary for Table GROUPS in *PHASE2\ECO* Subdirectory

Field Name **Paradox**	**Field Name** **FoxPro**	**Field Type [1]**	**Description**
Station	[2]	A8	Station number
Group	[2]	A25	Group identifier

[1] A: character field with number denoting size of field
D: date field
N: number field
M: memo field

[2] Same as Paradox

Table 3-78
Data Dictionary for Table BENTHIC in *PHASE2\ECO* Subdirectory

Field Name **Paradox**	**Field Name** **FoxPro**	**Field Type [1]**	**Description**
TAMS ID	tams_id	A11	Sample identifier
TAMS Type	tams_type	A3	Sample type [2]
Species	[3]	A8	Species code
SAS No.	sas_nox	A8	Laboratory identifier
Wet Weight (mg)	wet_weight	N	Sample wet weight in mg
Comments	[3]	A160	Sample comment

[1] A: character field with number denoting size of field
D: date field
N: number field
M: memo field

[2] B: Field blank
D: Duplicate sample

Table 3-79
Data Dictionary for Table FISH in *PHASE2\ECO* Subdirectory

Field Name **Paradox**	**Field Name** **FoxPro**	**Field Type [1]**	**Description**
TAMS ID	tams_id	A11	Sample identifier
TAMS Type	tams_type	A3	Sample type [2]
Species	[3]	A8	Species code
SAS No.	sas_nox	A8	Laboratory identifier
# of fish in sample	xxof_fish	N	Number of fish in samples
L1 (mm)	l1_mmx	N	Length in mm of fish number 1
L2 (mm)	l2_mmx	N	Length in mm of fish number 2
L3 (mm)	l3_mmx	N	Length in mm of fish number 3
L4 (mm)	l4_mmx	N	Length in mm of fish number 4
L5 (mm)	l5_mmx	N	Length in mm of fish number 5
L6 (mm)	l6_mmx	N	Length in mm of fish number 6
L7 (mm)	l7_mmx	N	Length in mm of fish number 7
L8 (mm)	l8_mmx	N	Length in mm of fish number 8
Length#	lengthx	N	Number of fish used to determine average length
Sum	[3]	N	Sum of fish lengths used to determine average lenth
Average length	average_le	N	Average of lengths
Average weight	average_we	N	Average of weights
Bulk weight	bulk_weigh	N	Total weight of the fish sample

[1] A: character field with number denoting size of field
D: date field
N: number field
M: memo field

[2] B: Field blank
D: Duplicate sample

[3] Same as Paradox

Table 3-80
Data Dictionary for Tables PCBS, PCBINV, PCBFISH in *PHASE2\ECO* Subdirectory

Field Name **Paradox**	**Field Name** **FoxPro**	**Field Type [1]**	**Description**
TAMS ID	tams_id	A11	Sample identifier
TAMS Type	tams_type	A3	Sample type [2]
Species	[3]	A4	Species code (not present in **PCBS**)
Split	[3]	A10	Field denoting if record represents a composite of duplicate analyses (Avg-FD - average of field duplicates)
Matrix	[3]	A10	Sample matrix (SED, BIOTA)
Parameter	[3]	A28	Parameter name
Units	[3]	A10	Units of result
Value1	[3]	N	Numerical result with non-detected values set to sample quantitation limit [4]
Value2	[3]	N	Numerical result with non-detected values set to 0 of 1/2 quantitation limit
Qualifier	[3]	A6	Data qualifier
QA Comment	qa_comment	A10	Quality Assurance comment code see ***PHASE2*\QUALIFY**
Validated?	validated	A3	Field denoting if results have been validated (Yes/No)

[1] A: character field with number denoting size of field
D: date field
N: number field
M: memo field

[2] B: Field blank
D: Duplicate sample

[3] Same as Paradox

[4] Homologue sums and Total PCBs values represent sums of detected values only.

Table 3-81
Data Dictionary for Tables PCBSD, PCBINVD, PCBFISHD in *PHASE2\ECO* Subdirectory

Field Name **Paradox**	**Field Name** **FoxPro**	**Field Type [1]**	**Description**
TAMS ID	tams_id	A11	Sample identifier
TAMS Type	tams_type	A3	Sample type [2]
Matrix	[3]	A8-A10	Sample matrix (SED, BIOTA)
Parameter	[3]	A28	Parameter name
Units	[3]	A10	Units of result
Species	[3]	A4	Contained in PCBINVD only
Value	[3]	N	Numerical result with non-detected values set to sample quantitation limit; PCBINVD contains value1 and value2
Qualifier	[3]	A6-A10	Data qualifier
QA Comment	qa_comment	A10	Quality Assurance comment code see ***PHASE2*\QUALIFY**
Validated	[3]	A3	Field denoting if results have been validated (Yes/No)

[1] A: character field with number denoting size of field
D: date field
N: number field
M: memo field

[2] B: Field blank
D: Duplicate sample

[3] Same as Paradox

Table 3-82
Data Dictionary for Tables NONPCBB, NONPCBBD, NONPCBS, NONPCBSD, LASERGS, LASERGSD in *PHASE2\ECO* Subdirectory

Field Name **Paradox**	**Field Name** **FoxPro**	**Field Type [1]**	**Description**
TAMS ID	tams_id	A11	Sample identifier
TAMS Type	tams_type	A3	Sample type [2]
Species	[3]	A4	Species code (not present in **NONPCBS, NONPCBSD or LASERGS**)
SAS No.	sas_nox	A8	Sample identifier for laboratory program
Split	[3]	A10	Field denoting if record represents a composite of duplicate analyses (Avg-FD - average of field duplicates) in **NONPCBB** or **NONPCBS**; non-blank entry in **NONPCBBD** or **NONPCBSD** represents a laboratory duplicate anlaysis
Laboratory	[3]	A10	Name of laboratory performing analysis
SDG No.	sdg_nox	A12	Sample delivery group (for data validation)
Parameter	[3]	A30	Parameter name
Units	[3]	A10	Units of result
Value	[3]	N	Numerical result with non-detected values set to sample detection limit
Qualifier	[3]	A4	Data qualifier
Validated	[3]	A4	Field denoting if results have been validated (Yes/No)

[1] A: character field with number denoting size of field
D: date field
N: number field
M: memo field

[2] B: Field blank
D: Duplicate sample

[3] Same as Paradox

Table 3-83
Data Dictionary for Table FB in *PHASE2/ECO* Subdirectory

Field Name **Paradox**	**Field Name** **FoxPro**	**Field Type [1]**	**Description**
TAMS ID	tams_id	A11	Sample identifier
TAMS Type	tams_type	A3	Sample type [2]
SAS No.	sas_nox	A8	Sample identifier for laboratory program
Split	[3]	A10	Non-blank entry denotes a laboratory duplicate or split sample
Laboratory	[3]	A10	Name of laboratory performing analysis
SDG No.	sdg_nox	A12	Sample delivery group (for data validation)
Parameter	[3]	A30	Parameter name
Value	[3]	N	Numerical result with non-detected values set to sample detection limit
Qualifier	[3]	A4	Data qualifier

[1] A: character field with number denoting size of field
D: date field
N: number field
M: memo field

[2] B: Field blank
D: Duplicate core

[3] Same as Paradox

Table 3-84
Data Dictionary for Table SPECIES in *PHASE2\ECO* Subdirectory

Field Name **Paradox**	**Field Name** **FoxPro**	**Field Type**	**Description**
Species	[2]	A8	Species code
Definition	[2]	A20	Definition of species code

[1] A: character field with number denoting size of field
D: date field
N: number field
M: memo field

[2] Same as Paradox

TABLE 3-85
Tables in *PHASE2\HRCORES* Subdirectory

Table Name	Description
STATIONS	Confirmatory Sampling and High-Resolution Sediment Coring Program sampling stations
PCBS	PCB congeners/homologue sums/Aroclor sums - sediment samples (µg/kg DW)
PCBSD	PCB congeners - duplicate sediment sample pairs (µg/kg DW)
NONPCBS	Non-PCB data - sediment samples
NONPCBSD	Non-PCB data - duplicate sediment sample pairs
FB	Non-PCB data - field blanks
LASERGS	Laser grain size Phi classes
LASERGSD	Laser grain size Phi classes - duplicate pairs
RADNUC	Radionuclide data - sediment samples
RADNUCD	Radionuclide data - sediment samples field duplicates
SEDDESC	Redox, density and additional field information
GROUPS	Sample groupings

TABLE 3-86
Data Dictionary for Table STATIONS in *PHASE2\HRCORES* Subdirectory

Field Name **Paradox**	**Field Name** **FoxPro**	**Field Type [1]**	**Description**
Station	[2]	A8	Station number
TAMS ID	tams_id	A11	Sample identifier
TAMS SampType	tams_type	A3	Sample type [3]
Date Sampled	date_sampl	D	Date sample was taken
Time Sampled	time_sampl	A10	Time sample was taken
Lower Depth (cm)	lower_dept	N	Depth of top of sediment slice (cm)
Upper Depth (cm)	upper_dept	N	Depth of bottom of sediment slice (cm)
River Mile	river_mile	N	River mile measured from the Battery
Est Easting	[2]	N	Estimated NY State Plane easting (ft)
Est Northing	[2]	N	Estimated NY State Plane northing (ft)
Location	[2]	A30	Station description
Program	[2]	A3	Program abbreviation (HR, CS, CG) [4]
SAS No.	sas_nox	A10	Sample identifier for laboratory program
Comment	[2]	A120	Sample comment

[1] A: character field with number denoting size of field
D: date field
N: number field
M: memo field

[2] Same as Paradox

[3] A: Archive core
B: Field blank
D: Duplicate core
G: Grain size core
M: Matrix spike sample or core
P: PCB core
X: X-Ray core

[4] CC: Confirmatory sampling core
CG: Confirmatory sampling grab
HR: High-resolution sediment core
LR: Low-resolution sediment core

TABLE 3-87
Data Dictionary for Table GROUPS in *PHASE2\HRCORES* Subdirectory

Field Name **Paradox**	**Field Name** **FoxPro**	**Field Type [1]**	**Description**
Station	[2]	A8	Station number
Group	[2]	A25	Group identifier

[1] A: character field with number denoting size of field
D: date field
N: number field
M: memo field

[2] Same as Paradox

TABLE 3-88
Data Dictionary for Table PCBS in *PHASE2\HRCORES* Subdirectory

Field Name **Paradox**	**Field Name** **FoxPro**	**Field Type [1]**	**Description**
TAMS ID	tams_id	A11	Sample identifier
TAMS Type	tams_type	A3	Sample type [2]
Split	[3]	A10	Field denoting if record represents a composite of duplicate analyses (Avg-FD - average of field duplicates)
Matrix	[3]	A8	Sample matrix (SED)
Parameter	[3]	A28	Parameter name
Units	[3]	A10	Units of result
Value1	[3]	N	Numerical result with non-detected values set to sample quantitation limit [4]
Value2	[3]	N	Numerical result with non-detected values set to 0 of 1/2 quantitation limit
Qualifier	[3]	A5	Data qualifier
QA Comment	qa_comment	A10	Quality Assurance comment code see ***PHASE2*\QUALIFY**
Validated?	validated	A3	Field denoting if results have been validated (Yes/No)

[1] A: character field with number denoting size of field
D: date field
N: number field
M: memo field

[2] A: Archive core
B: Field blank
D: Duplicate core
G: Grain size core
M: Matrix spike sample or core
P: PCB core
X: X-Ray core

[3] Same as Paradox

[4] Homologue sums and Total PCBs values represent sums of detected values only.

Table 3-89
Data Dictionary for Tables PCBSD in *PHASE2\HRCORES* Subdirectory

Field Name **Paradox**	**Field Name** **FoxPro**	**Field Type [1]**	**Description**
TAMS Sample ID	tams_sampl	A11	Sample identifier
TAMS SampType	tams_sampt	A3	Sample type [2]
Matrix	[3]	A8	Sample matrix (SED)
Parameter	[3]	A28	Parameter name
Units	[3]	A10	Units of result
Value	[3]	N	Numerical result with non-detected values set to sample detection limit
Qualifier	[3]	A5	Data qualifier
Validated	[3]	A3	Field denoting if results have been validated (Yes/No)
Date Sampled	date_sampl	D	Date sample was taken

[1] A: character field with number denoting size of field
D: date field
N: number field
M: memo field

[2] A: Archive core
B: Field blank
D: Duplicate core
G: Grain size core
M: Matrix spike sample or core
P: PCB core
X: X-Ray core

[3] Same as Paradox

Table 3-90
Data Dictionary for Tables NONPCBS, NONPCBSD, LASERGS, LASERGSD in *PHASE2/HRCORES* Subdirectory

Field Name **Paradox**	**Field Name** **FoxPro**	**Field Type [1]**	**Description**
TAMS ID	tams_id	A11	Sample identifier
TAMS Type	tams_type	A3	Sample type [2]
SAS No.	sas_nox	A8	Sample identifier for laboratory program
Split	[3]	A10	Field denoting if record represents a composite of duplicate analyses (Avg-FD - average of field duplicates) in **NONPCBS**; non-blank entry in **NONPCBSD** represents a laboratory duplicate anlaysis
Laboratory	[3]	A10	Name of laboratory performing analysis
SDG No.	sdg_nox	A12	Sample delivery group (for data validation)
Parameter	[3]	A30	Parameter name
Units	[3]	A10	Units of result
Value	[3]	N	Numerical result with non-detected values set to sample detection limit
Qualifier	[3]	A4	Data qualifier
Validated	[3]	A4	Field denoting if results have been validated (Yes/No)

[1] A: character field with number denoting size of field
D: date field
N: number field
M: memo field

[2] A: Archive core
B: Field blank
D: Duplicate core
G: Grain size core
M: Matrix spike sample or core
P: PCB core
X: X-Ray core

[3] Same as Paradox

Table 3-91
Data Dictionary for Table FB in *PHASE2\HRCORES* Subdirectory

Field Name **Paradox**	**Field Name** **FoxPro**	**Field Type [1]**	**Description**
TAMS ID	tams_id	A11	Sample identifier
TAMS Type	tams_type	A3	Sample type [2]
SAS No.	sas_nox	A8	Sample identifier for laboratory program
Split	[3]	A10	Non-blank entry denotes a laboratory duplicate or split sample
Laboratory	[3]	A10	Name of laboratory performing analysis
SDG No.	sdg_nox	A12	Sample delivery group (for data validation)
Parameter	[3]	A30	Parameter name
Units	[3]	A10	Units of result
Value	[3]	N	Numerical result with non-detected values set to sample detection limit
Qualifier	[3]	A3	Data qualifier

[1] A: character field with number denoting size of field
D: date field
N: number field
M: memo field

[2] A: Archive core
B: Field blank
D: Duplicate core
G: Grain size core
M: Matrix spike sample or core
P: PCB core
X: X-Ray core

[3] Same as Paradox

Table 3-92
Data Dictionary for Tables RADNUC, RADNUCD in *PHASE2\HRCORES* Subdirectory

Field Name **Paradox**	**Field Name** **FoxPro**	**Field Type [1]**	**Description**
TAMS ID	tams_id	A11	Sample identifier
TAMS Type	tams_type	A3	Sample type [2]
Split	[3]	A4	Non-blank entry denotes a laboratory duplicate or split sample
Laboratory	[3]	A10	Name of laboratory performing analysis
SDG No.	sdg_nox	A5	Sample delivery group (for data validation)
Date Sampled	date_sampl	D	Sample date
Counting Date	counting_d	D	Date sample was counted
Detector	[3]	A11	Detector type
Parameter	[3]	A30	Parameter name
Units	[3]	A10	Units of result
Sigma	[3]	N	Standard deviation associated with counting result
Value	[3]	N	Numerical result with non-detected values set to sample quantitation limit
Det Limit	det_limit	N	Reported counter detector limit
Qualifier	[3]	A3	Data qualifier
Validated	[3]	A4	Field denoting if results have been validated (Yes/No)

[1] A: character field with number denoting size of field
D: date field
N: number field

[2] Sample Type Categories
A: Archive core
B: Field blank
D: Duplicate core
G: Grain size core
M: Matrix spike sample or core
P: PCB core
X: X-Ray core

[3] Same as Paradox

Table 3-93
Data Dictionary for Table SEDDESC in *PHASE2\HRCORES* Subdirectory

Field Name **Paradox**	**Field Name** **FoxPro**	**Field Type [1]**	**Description**
TAMS ID	tams_id	A13	Sample identifier
TAMS Type	tams_type	A3	Sample type [2]
Eh	[3]	N	Redox potential in meV
Temperature	temperatux	N	Temperature of redox measurement in EC
Field Comment	field_comx	A50	Comments from field notes
Percent Solids	percent_sx	N	Percent solids by dry weight
Bulk density (g/cc)	bulk_densx	N	Calculated bulk density in g/cc
Part. density (g/cc)	part_densx	N	Calculated particle density in g/cc

[1] A: character field with number denoting size of field
D: date field
N: number field
M: memo field

[2] A: Archive core
B: Field blank
D: Duplicate core
G: Grain size core
M: Matrix spike sample or core
P: PCB core
X: X-Ray core

[3] Same as Paradox

Table 3-94
Data Dictionary for Table FLOW93 in *PHASE2\FLOW* Subdirectory

Field Name **Paradox**	**Field Name** **FoxPro**	**Field Type [1]**	**Description**
Date	date	D	Measurement data
Fort Edward Meas. Flow	fort_edwar	N	Reported USGS flow at Fort Edward in cfs
Stillwater Calc. Flow	stillwater	N	Calculated flow at Stillwater in cfs [2]
Model-Stillwater	model_stil	A4	Model used to calculate flow at Stillwater [2]
Waterford Calc. Flow	waterfordx	N	Calculated flow at Waterford in cfs [2]
Model-Waterford	model_wate	A4	Model used to calculate flow at Waterford [2]

[1] A: character field with number denoting size of field
D: date field
N: number field
M: memo field

[2] These flows were modelled based on the reported flow at Fort Edward and the Champlain Canal staff gauge data contained in *NYSDOT***GAUGES**.
These models will be explained in the Phase2 Data Evaluation and Interpretation Report.

Table 3-95
Tables in *NOAA* Directory

Table Name	Description
STATIONS	Ecological Survey stations
COORDS	Coordinates for stations
FISH	Sample composition information - fish
PCBFISH	PCB congeners/homologue sum/Aroclor concentrations - fish
PCBFISHD	PCB congeners - fish duplicate pairs/dilution analyses
NONPCBB	Non-PCB data - biota
SPECIES	Key to species codes

Table 3-96
Data Dictionary for Table STATIONS in *NOAA* Directory

Field Name **Paradox**	**Field Name** **FoxProx**	**Field Type [1]**	**Description**
Station	[2]	A8	Station number
TAMS ID	tams_id	A11	Sample identifier
TAMS Type	tams_type	A4	Sample type [3]
Species	[2]	A4	Species code
Date Sampled	date_sampl	D	Sample date
Est Easting	est_eastin	N	Estimated NY State Plane easting (ft)
Est Northing	est_northi	N	Estimated NY State Plane northing 9ft)
River Mile	river_mile	N	Mile measured from the Battery
Description	descriptio	A26	Station description
Program	[2]	A4	Program abbreviation (EC) [4]
SAS No.	sas_nox	A8	Sample identifier for laboratory program
Comment.	comment	A120	Sample comment

[1] A: character field with number denoting size of field
D: date field
N: number field
M: memo field

[2] Same as Paradox

[3] B: Field blank
D: Duplicate sample
N: NOAA sample

[4] EC: Ecological survey

Table 3-97
Data Dictionary for Table COORDS in *NOAA* Directory

Field Name **Paradox**	**Field Name** **FoxPro**	**Field Type [1]**	**Description**
Station	[2]	A16	Station name
Est Easting	est_eastin	N	Estimated NY state plane easting (ft)
Est Northing	est_northi	N	Estimated NY state plane northing (ft)
Sample Type	sample_typ	A23	Type of sample taken
Fish Type	fish_typ	A18	Type of fish taken

[1] A: character field with number denoting size of field
D: date field
N: number field
M: memo field

[2] Same as Paradox

Table 3-98
Data Dictionary for Table FISH in *NOAA* Directory

Field Name **Paradox**	**Field Name** **FoxPro**	**Field Type [1]**	**Description**
TAMS ID	tams_id	A11	Sample identifier
TAMS Type	tams_type	A3	Sample type [2]
Species	[3]	A8	Species code
SAS No.	sas_nox	A8	Laboratory identifier
Noincomp	[3]	A3	Number of fish in composite
Length	[3]	N	Length in centimeters
Weight	[3]	N	Weight in grams
Sex	[3]	A1	Sex

[1] A: character field with number denoting size of field
D: date field
N: number field
M: memo field

[2] B: Field blank
D: Duplicate sample
N: NOAA sample

[3] Same as Paradox

Table 3-99
Data Dictionary for Table PCBFISH in *NOAA* Directory

Field Name **Paradox**	**Field Name** **FoxPro**	**Field Type [1]**	**Description**
TAMS ID	tams_id	A11	Sample identifier
TAMS Type	tams_type	A3	Sample type [2]
Species	[3]	A4	Species code
Split	[3]	A10	Field denoting if record represents a composite of duplicate analyses (Avg-FD - average of field duplicates)
Matrix	[3]	A8	Sample matrix (SED, BIOTA)
Parameter	[3]	A28	Parameter name
Units	[3]	A10	Units of result
Value1	[3]	N	Numerical result with non-detected values set to sample quantitation limit [4]
Value2	[3]	N	Numerical result with non-detected values set to 0 of 1/2 quantitation limit
Qualifier	[3]	A6	Data qualifier
QA Comment	qa_comment	A10	Quality Assurance comment code see ***PHASE2*\QUALIFY**
Validated?	validated	A4	Field denoting if results have been validated (Yes/No)

[1] A: character field with number denoting size of field
D: date field
N: number field
M: memo field

[2] B: Field blank
D: Duplicate sample

[3] Same as Paradox

[4] Homologue sums and Total PCBs values represent sums of detected values only.

Table 3-100
Data Dictionary for Table PCBFISHD in *NOAA* Directory

Field Name **Paradox**	**Field Name** **FoxPro**	**Field Type [1]**	**Description**
TAMS ID	tams_id	A11	Sample identifier
TAMS Type	tams_type	A4	Sample type [2]
Matrix	[3]	A8	Sample matrix (BIOTA)
Parameter	[3]	A28	Parameter name
Units	[3]	A10	Units of result
Species	[3]	A4	Species code; see **SPECIES** table for definition of codes
Value	[3]	N	Numerical result with non-detected values set to sample quantitation limit
Qualifier	[3]	A6	Data qualifier
QA Comment	qa_comment	A10	Quality Assurance comment code see ***PHASE2*\QUALIFY**

[1] A: character field with number denoting size of field
D: date field
N: number field
M: memo field

[2] B: Field blank
D: Duplicate sample
N: NOAA sample

[3] Same as Paradox

Table 3-101
Data Dictionary for Tables NONPCBB in *NOAA* Directory

Field Name **Paradox**	**Field Name** **FoxPro**	**Field Type [1]**	**Description**
TAMS ID	tams_id	A11	Sample identifier
TAMS Type	tams_type	A3	Sample type [2]
Species	[3]	A4	Species code
SAS No.	sas_nox	A8	Sample identifier for laboratory program
Split	[3]	A10	Field denoting if record represents a composite of duplicate analyses (Avg-FD - average of field duplicates)
Laboratory	[3]	A10	Name of laboratory performing analysis
SDG No.	sdg_nox	A12	Sample delivery group (for data validation)
Parameter	[3]	A30	Parameter name
Units	[3]	A4	Units of result
Value	[3]	N	Numerical result with non-detected values set to sample detection limit
Qualifier	[3]	A4	Data qualifier
Validated	[3]	A4	Field denoting if results have been validated (Yes/No)

[1] A: character field with number denoting size of field
D: date field
N: number field
M: memo field

[2] B: Field blank
D: Duplicate sample
N: NOAA sample

[3] Same as Paradox

Table 3-102
Data Dictionary for Table SPECIES in *NOAA* Directory

Field Name **Paradox**	**Field Name** **FoxPro**	**Field Type [1]**	**Description**
Species	[2]	A8	Species code
Definition	[2]	A20	Definition of species code

[1] A: character field with number denoting size of field
D: date field
N: number field
M: memo field

[2] Same as Paradox

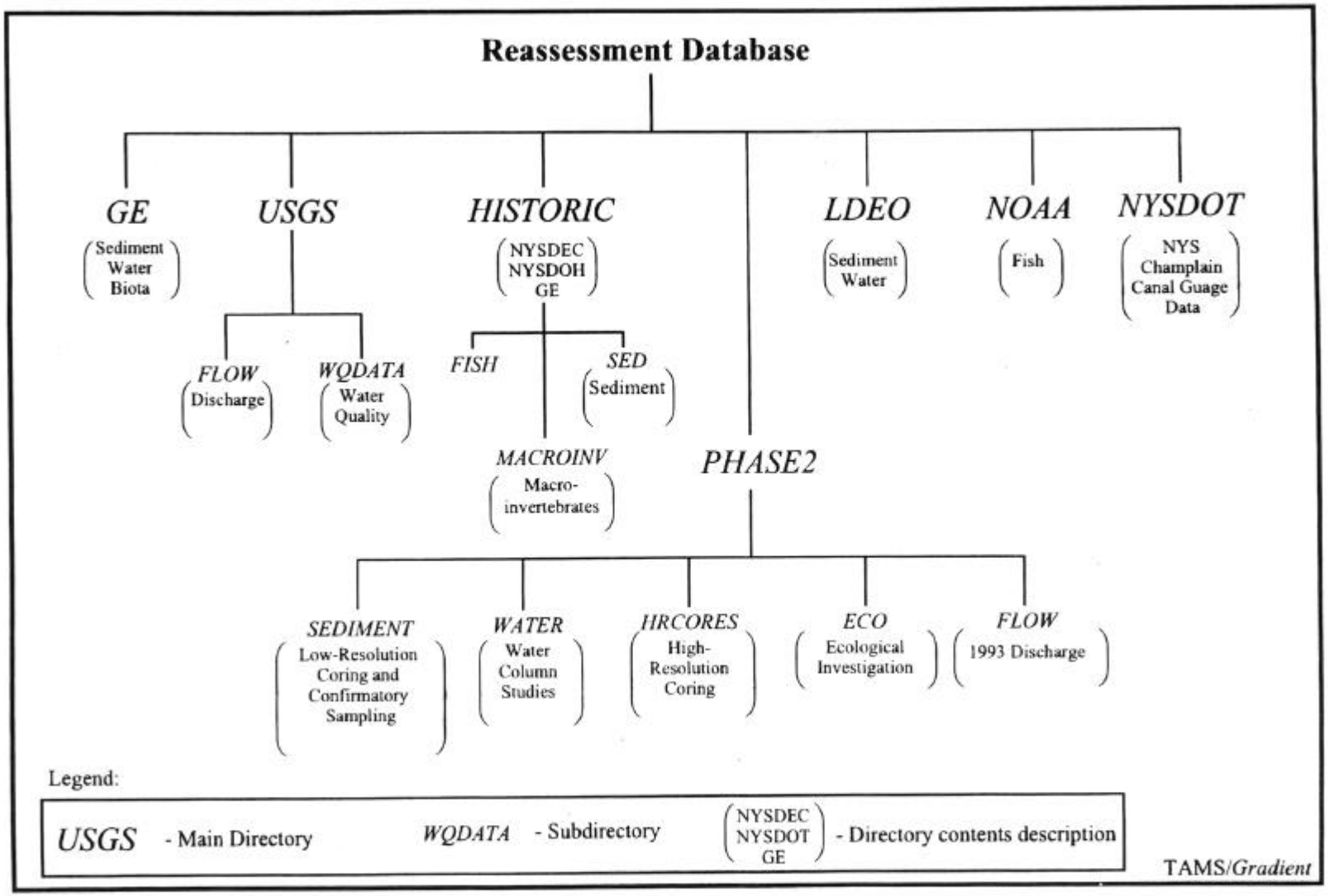


Figure 2-1
Descriptive Diagram of the Hudson River PCB Reassessment Database

Legend:

USGS	- Subdirectory name
BATK.DB	- File name
(2.4)	- Section in Phase 2 Report, Vol. 2A

RELEASE 2-2

DISCLAIM.TXT
README.TXT

LDEO (2.1)
- BOPP91-8.WK1
- BOPP88-6.WK1
- BOPP188.WK1
- WARREN.WK1

HISTORIC[1] (2.1)
- HIST_LUT.DB*
- PARAMKEY.DB

FISH
- COMPOS.DB
- CONCFISH.DB
- CORRNUM.DB
- GRADNUMF.DB
- PREP.DB
- REF.DB
- SAMPLEF.DB
- SPECCODE.DB

MACROINV
- CONC.DB
- DOHSITE.DB
- NUMINDI.DB
- OTHER.DB
- SAMPLE.DB
- SAMPREF.DB
- SPECCODE.DB

SED
- CONCSED.DB
- GE89.DB
- GRADNUMS.DB
- MASSPEC.DB
- NONCHEM.DB
- NONDETS.DB
- REACHES.DB
- REF.DB
- SAMPLES.DB
- SECTION.DB
- SOXHDUP.DB
- STATIONS.DB
- TEXTURES.DB

USGS (2.2)
- USGS_LUT.DB*

FLOW
- BATK.DB
- CORINTH.DB
- FTEDWD.DB
- GREEN.DB
- HADLEY.DB
- HOOS.DB
- MOHK.DB
- SACAND.DB
- SCHU.DB
- STILL.DB
- USGS7693.DB
- WATR.DB

WQDATA
- TOCDAT.DB
- USGSWQ.DB

GE (2.3)
- FIELD_LUT.DB*
- GEPARAMS.DB*
- PCB_LUT.DB*
- NONPCB.DB
- PCB.DB
- PCBCONG.DB
- PCBHOMOL.DB
- SAMPLE.DB
- SPECCODE.DB

NYSDOT (2.4)
- GAUGES.DB

PHASE 2 (2.5)
- AROCLSTD.DB (2.7)
- ASCREEN.DB (2.7)
- CONG_LUT.DB*
- FIELDS.DB*
- PARAMS.DB*
- QUALIFY.DB*

NOAA[2] (2.6)
- FISH.DB
- NONPCBB.DB
- PCBFISH.DB
- SPECIES.DB
- STATIONS.DB

QA/QC
- PCBFISHD.DB

SEDIMENT
- LASERGS.DB
- LRINFO.DB
- NONPCBS.DB
- PCBS.DB
- RADNUC.DB
- SEDDESC.DB
- SIEVEGS.DB
- STATIONS.DB

QA/QC
- FB.DB
- LASERGSD.DB
- NONPCBSD.DB
- PCBSD.DB
- RADNUCD.DB
- SIEVEGSD.DB

WATER
- GROUPS.DB
- NONPCBW.DB
- PCBFA7.DB
- PCBP.DB
- PCBW.DB
- STATIONS.DB
- VOLUMES.DB

QA/QC
- FB.DB
- NONPCBWD.DB
- PCBPD.DB
- PCBWD.DB
- PCBWTT.DB

HRCORES
- GROUPS.DB
- LASERGS.DB
- NONPCBS.DB
- PCBS.DB
- RADNUC.DB
- SEDDESC.DB
- STATIONS.DB

QA/QC
- FB.DB
- LASERGS.DDB
- NONPCBSD.DB
- PCBSD.DB
- RADNUCD.DB

FLOW
- FLOW93.DB

EQUILIB
- PCBPE.DB
- PCBWE.DB

ECO
- BENTHIC.DB
- FISH.DB
- GROUPS.DB
- LASERGS.DB
- NONPCBB.DB
- NONPCBS.DB
- PCBFISH.DB
- PCBINV.DB
- PCBS.DB
- SPECIES.DB
- STATIONS.DB

QA/QC
- FB.DB
- LASERGSD.DB
- NONPCBBD.DB
- NONPCBSD.DB
- PCBFISHD.DB
- PCBINVD.DB
- PCBSD.DB

Notes:
1. This subdirectory contains data from NYSDEC, NYSDOH and GE.
2. See the Phase 2 glossaries.
* These files provide definitions of fields and parameters contained in the corresponding directories.

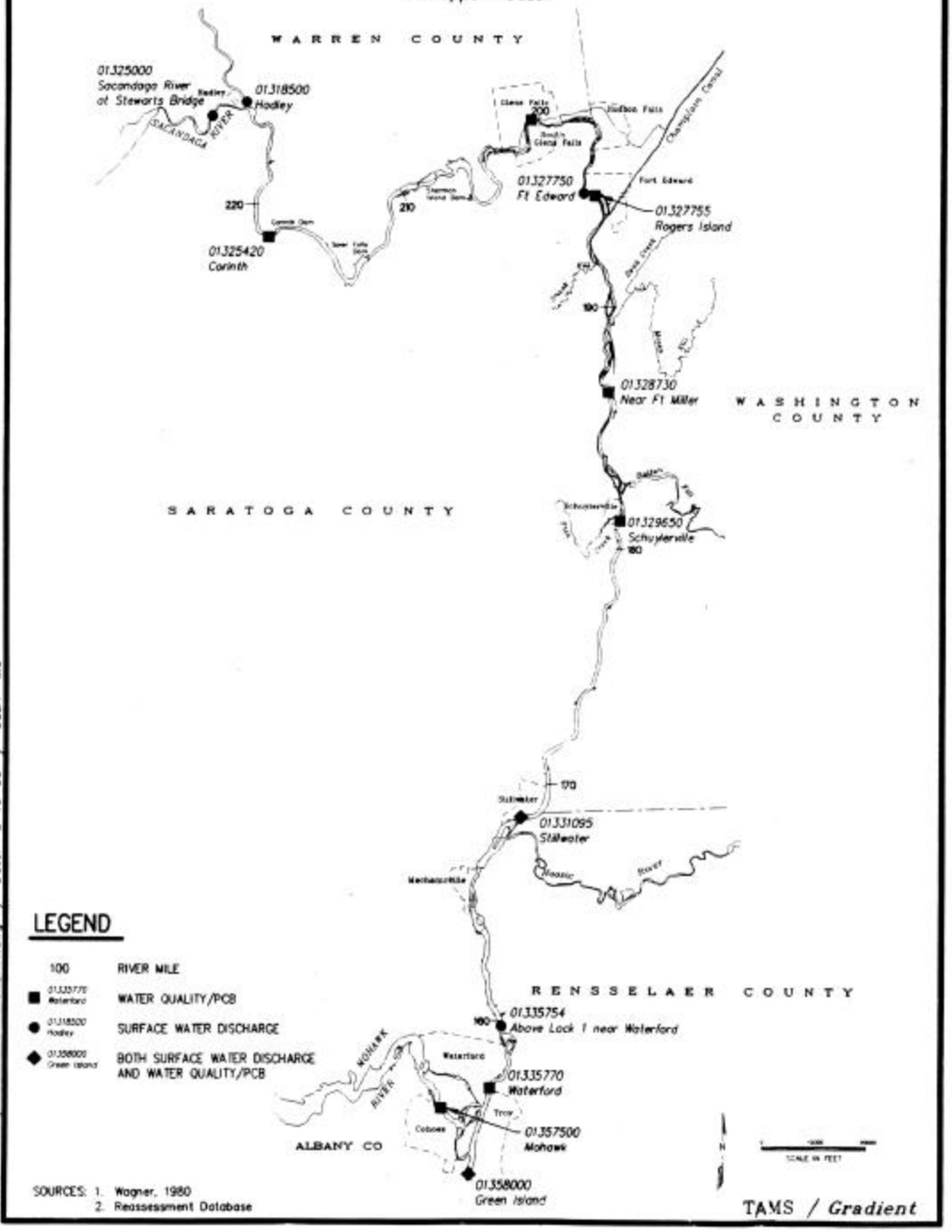
U.S. Environmental Protection Agency

TAMS / *Gradient*

Structure of the Hudson River PCB Reassessment Database

December 4, 1995

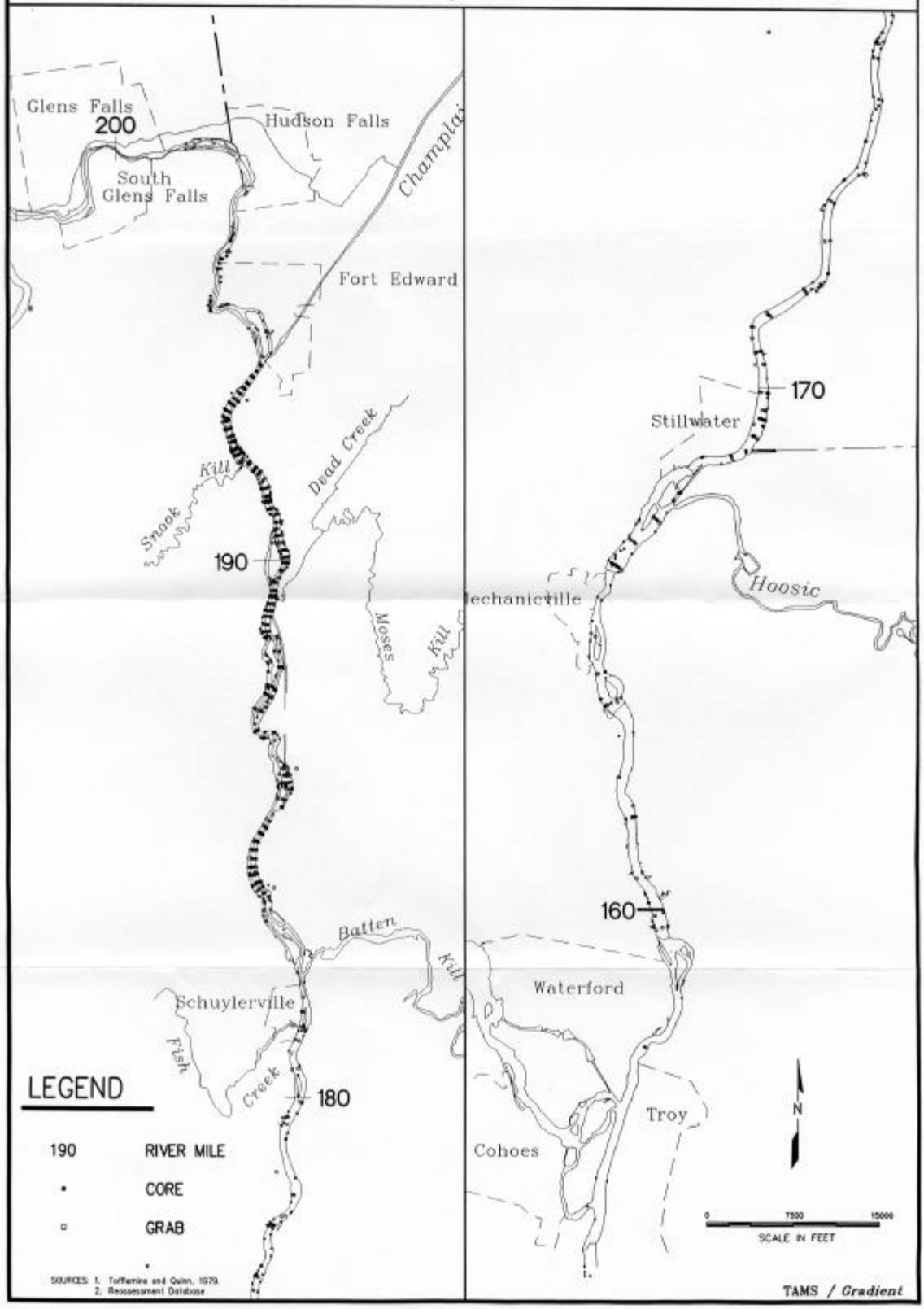
Figure 2-3
USGS Monitoring Sites in
the Upper Hudson



File No: 48 / Filename: FIGHBK11.dwg / Date: 2-15-95 / User: MC

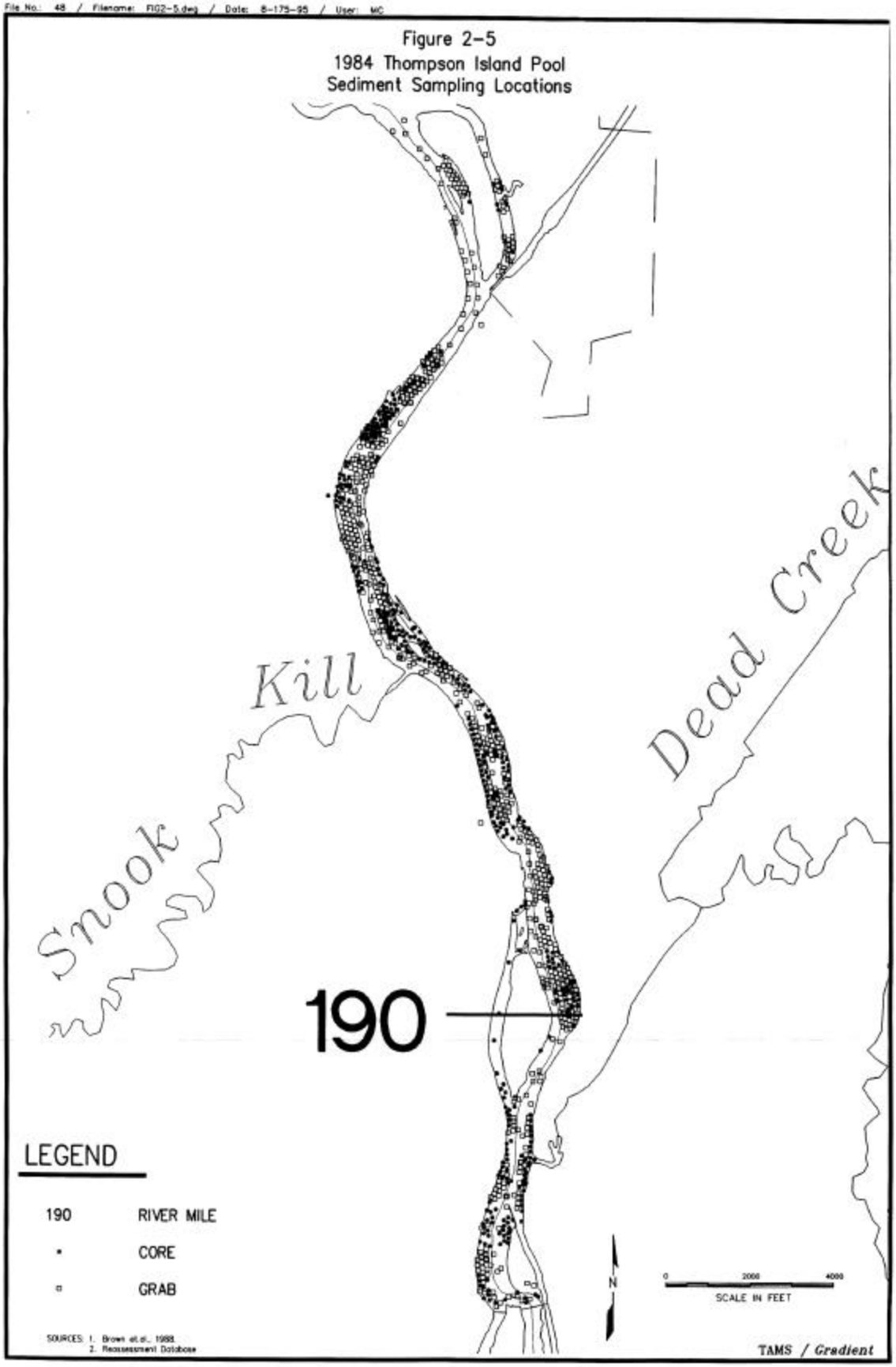
File No.: 48 / Filename: FIG2-4.dwg / Date: 8-17-95 / User: MC

Figure 2-4
NYSDEC 1976-78 Sediment
Sampling Locations



File No: 48 / Filename: FIG2-5.dwg / Date: 8-175-95 / User: MC

Figure 2-5
1984 Thompson Island Pool
Sediment Sampling Locations



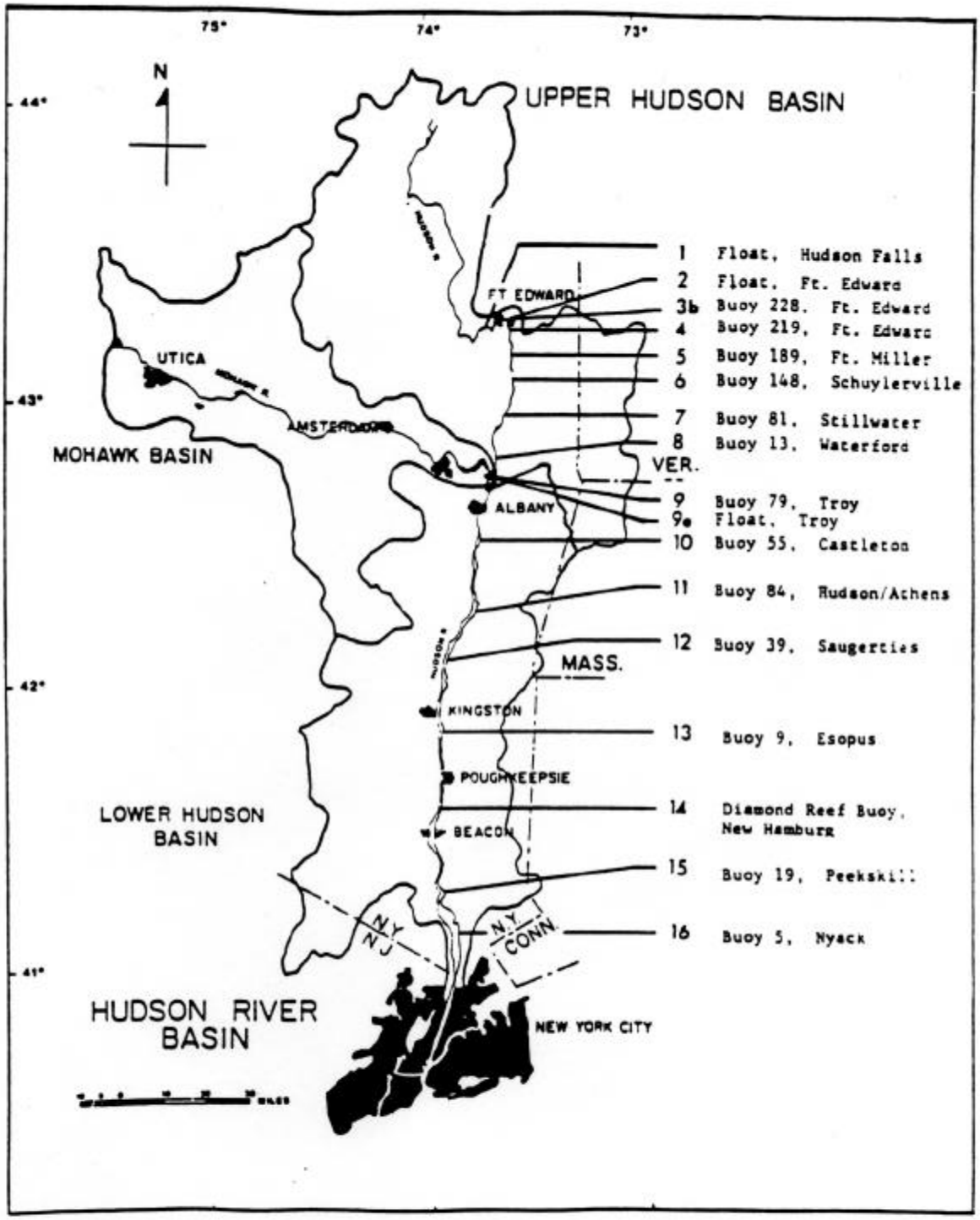
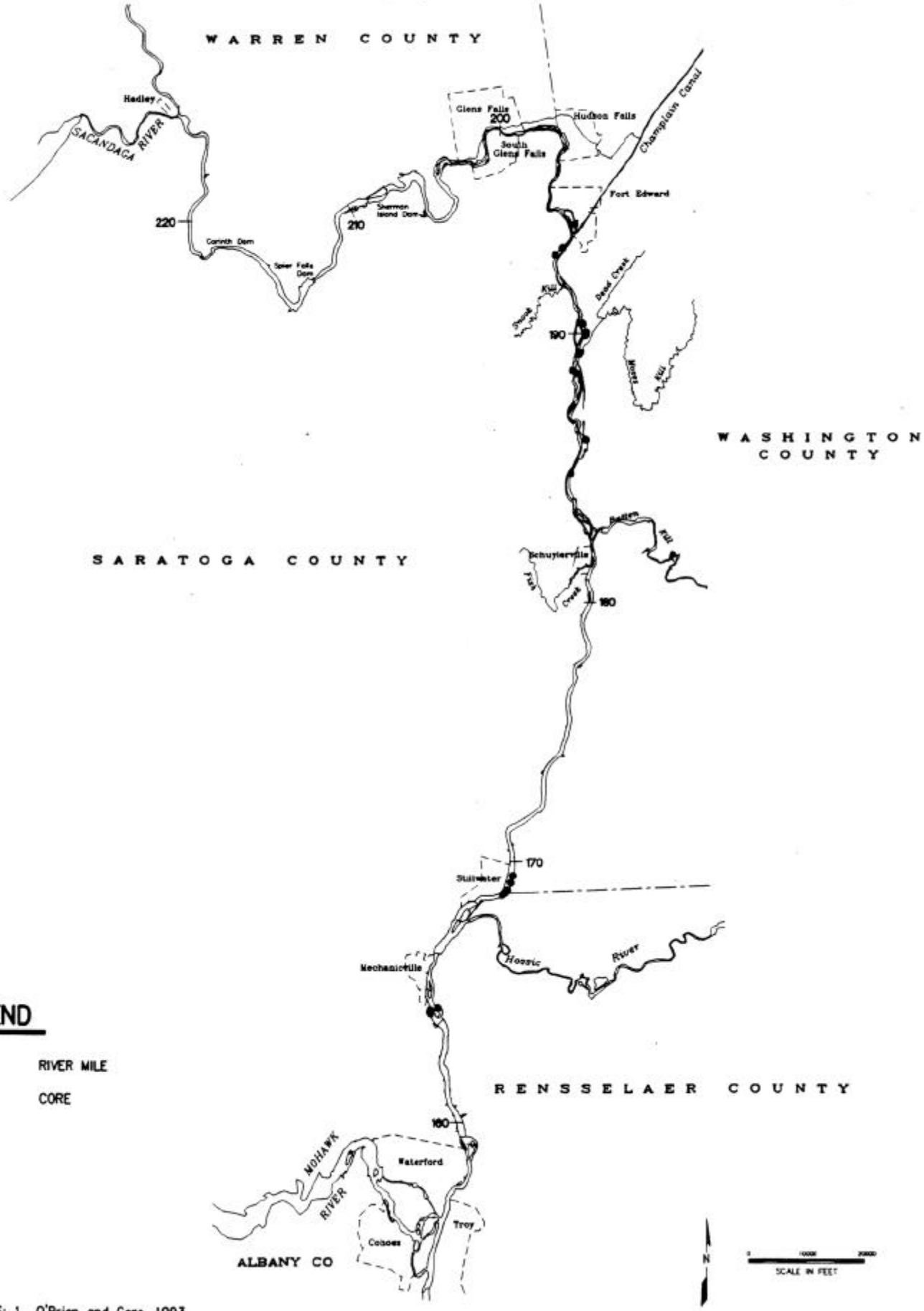


Figure 2-6

NYSDOH Macroinvertebrate Sampling Sites, Hudson River, 1978-1985

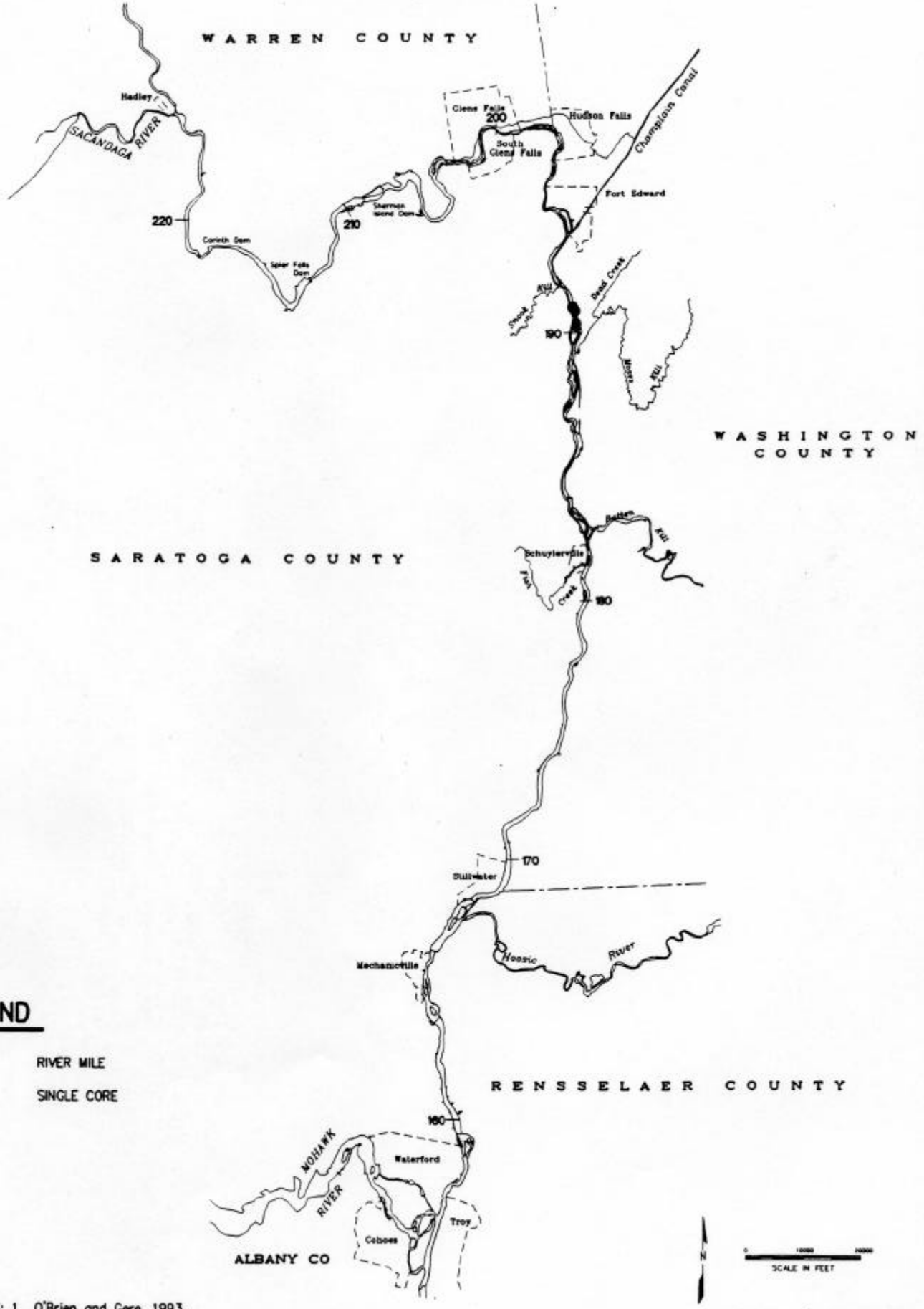
Source: Novak, *et al.*, 1988

Figure 2-7
1990 GE Sediment Sampling Locations



File No.: 48 / Filename: FIGH8X11.dwg / Date: 8-17-95 / User: MC

Figure 2-8
1991 GE Sediment Sampling Locations

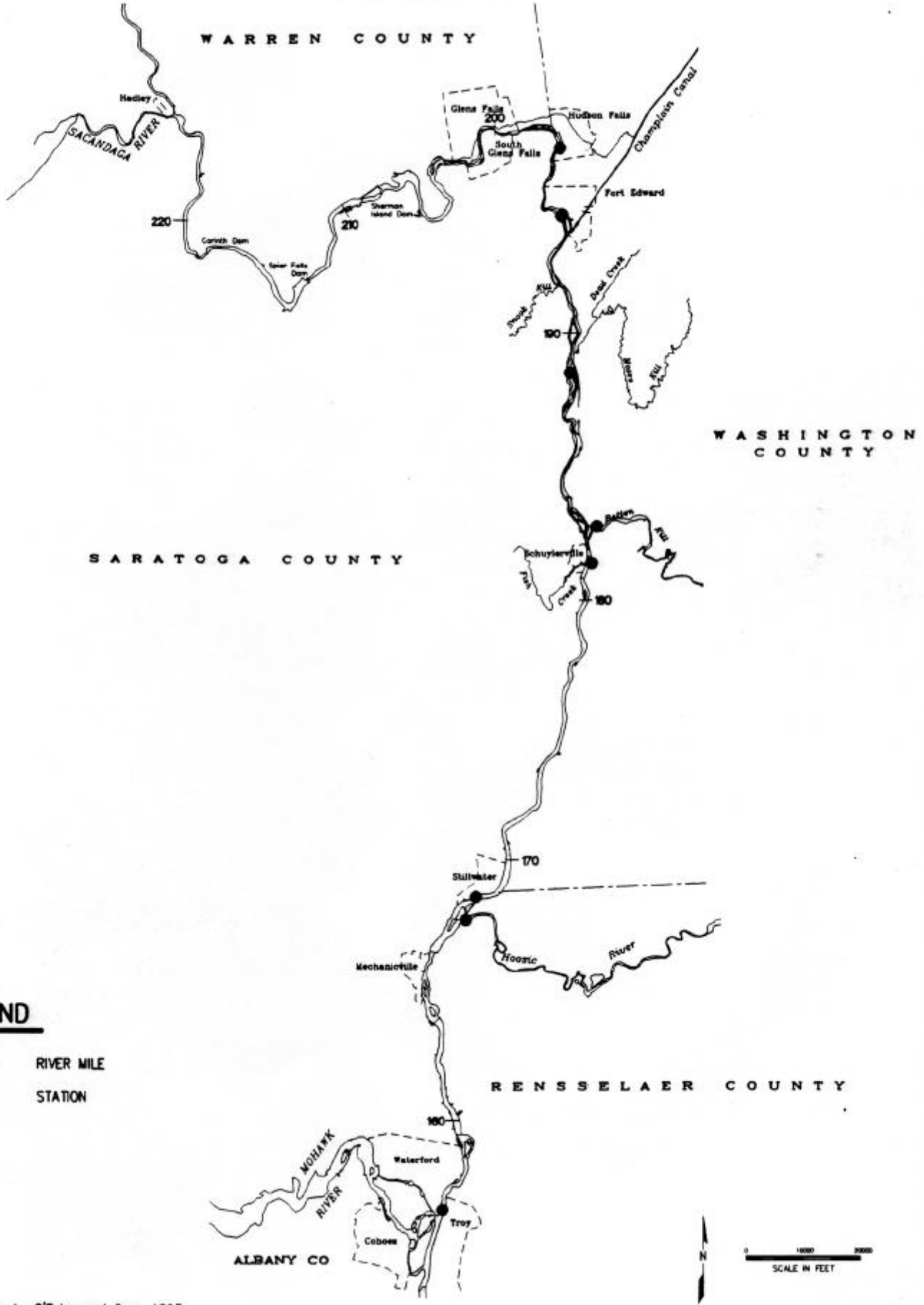


SOURCES: 1. O'Brien and Gere, 1993.
2. Reassessment Database

TAMS / *Gradient*

File No.: 48 / Filename: FIGHBX11.dwg / Date: 8-17-95 / User: MC

Figure 2-9
1991 GE Water Column
Sampling Locations

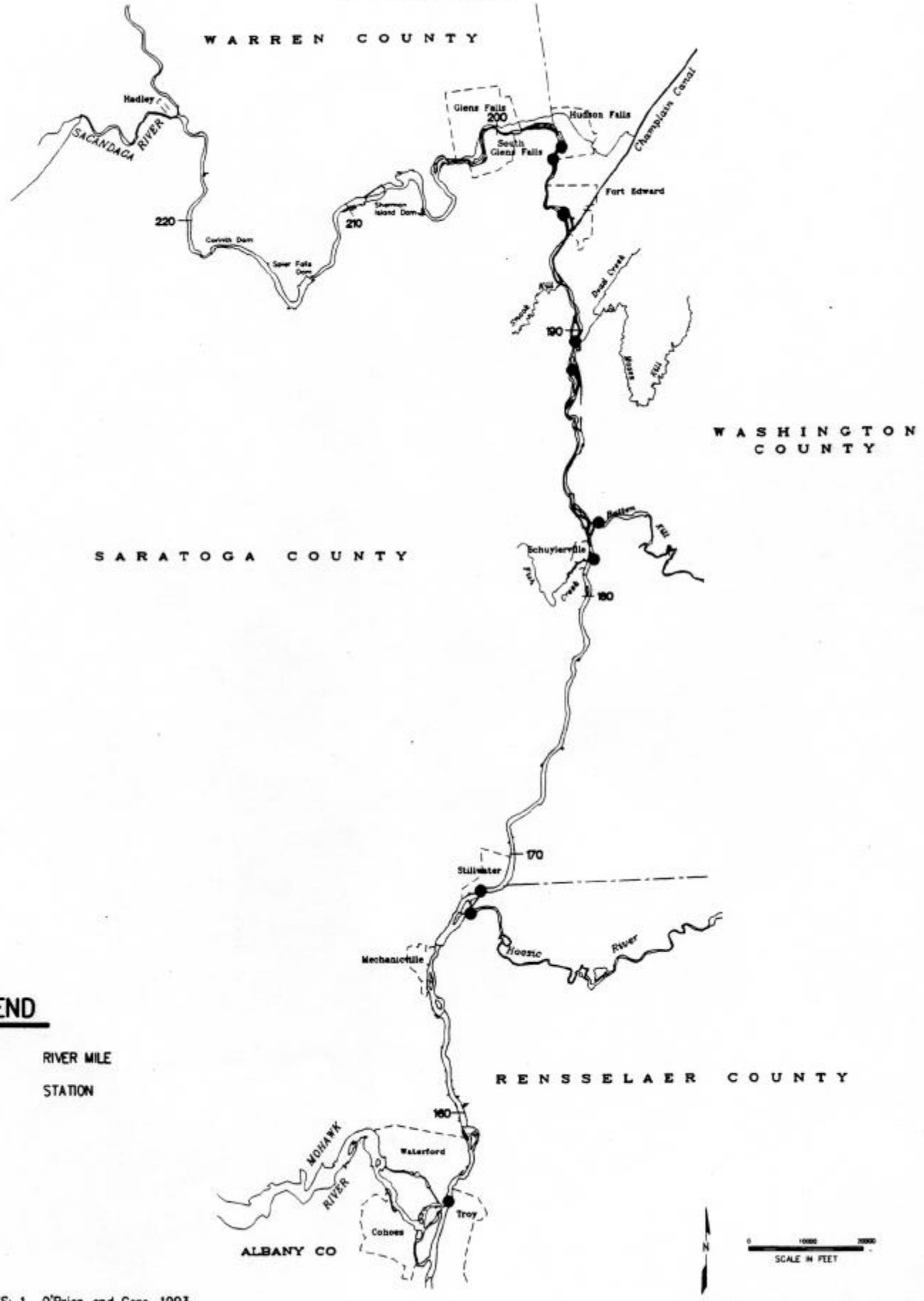


SOURCES: 1. O'Brien and Gere, 1993.
2. Reassessment Database

TAMS / *Gradient*

File No.: 48 / Filename: FIGH8X11.dwg / Date: 8-17-95 / User: MC

Figure 2-10
1992 GE Water Column
Sampling Locations

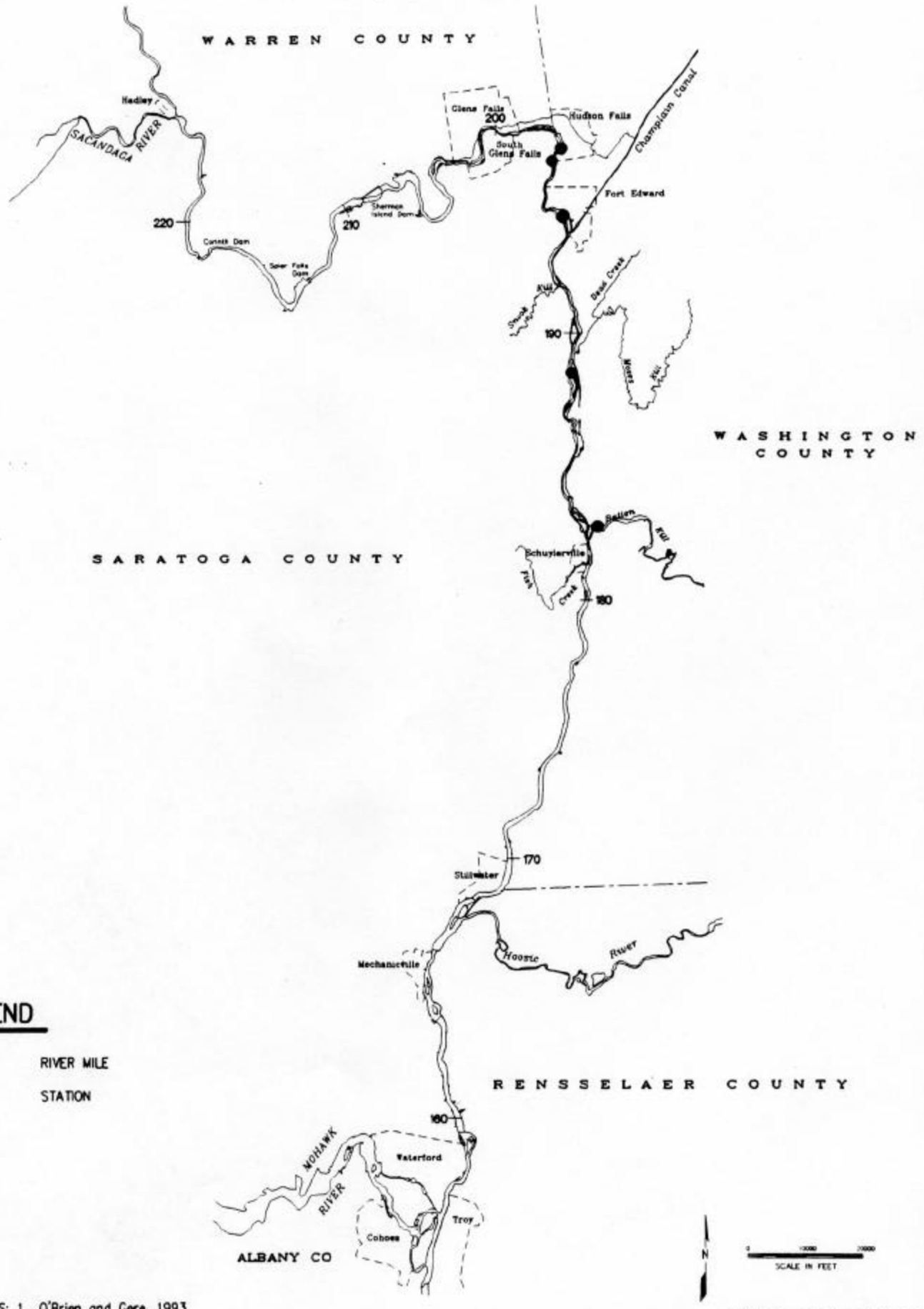


SOURCES: 1. O'Brien and Gere, 1993.
2. Reassessment Database

TAMS / *Gradient*

File No.: 48 / Filename: FIGH8X11.dwg / Date: 8-17-95 / User: MC

Figure 2-11
1993 GE Water Column Sampling Locations

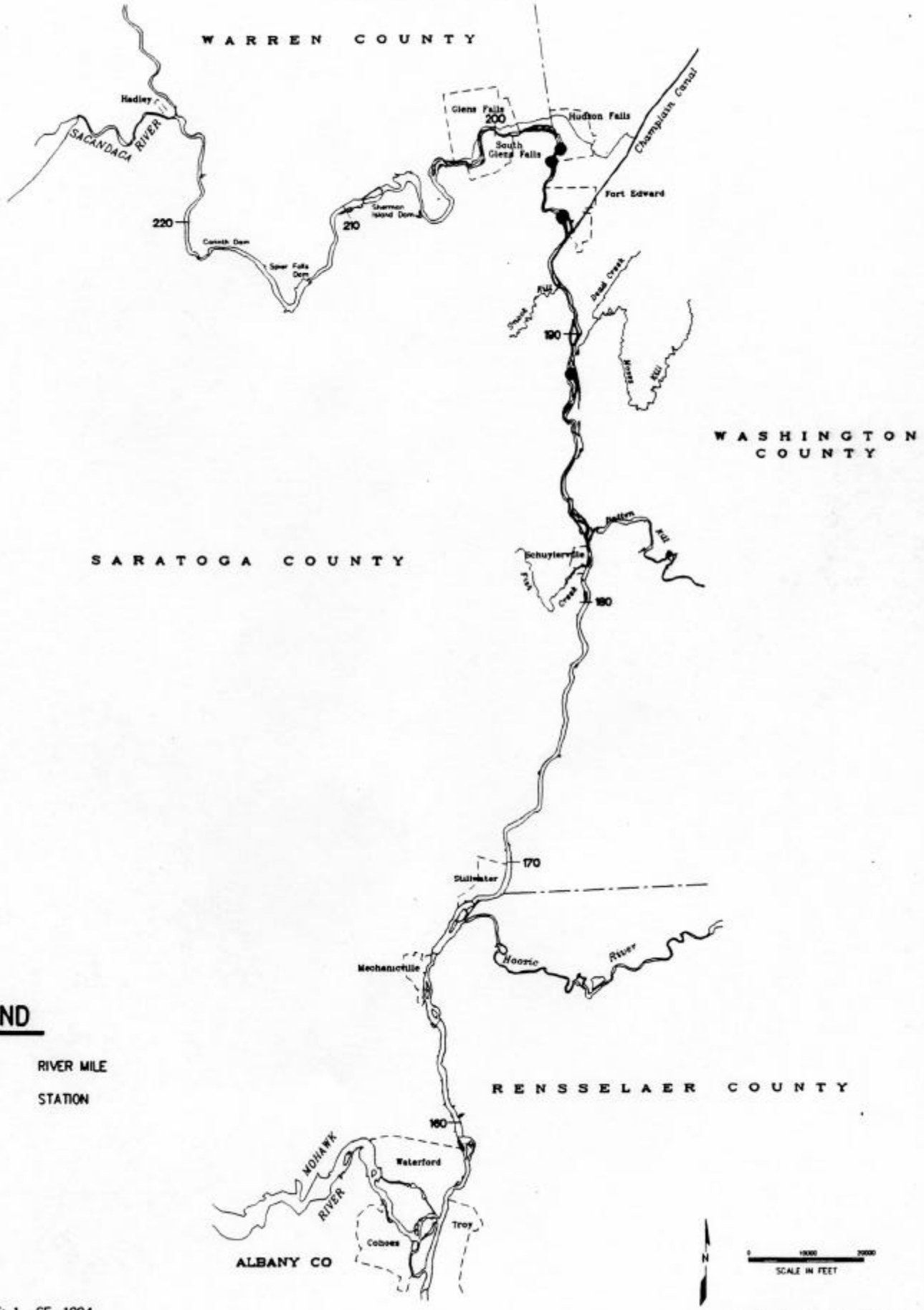


SOURCES: 1. O'Brien and Gere, 1993.
2. Reassessment Database

TAMS / *Gradient*

File No.: 48 / Filename: FIGH8X11.dwg / Date: 8-17-95 / User: MC

Figure 2-12
1994 GE Water Column
Sampling Locations



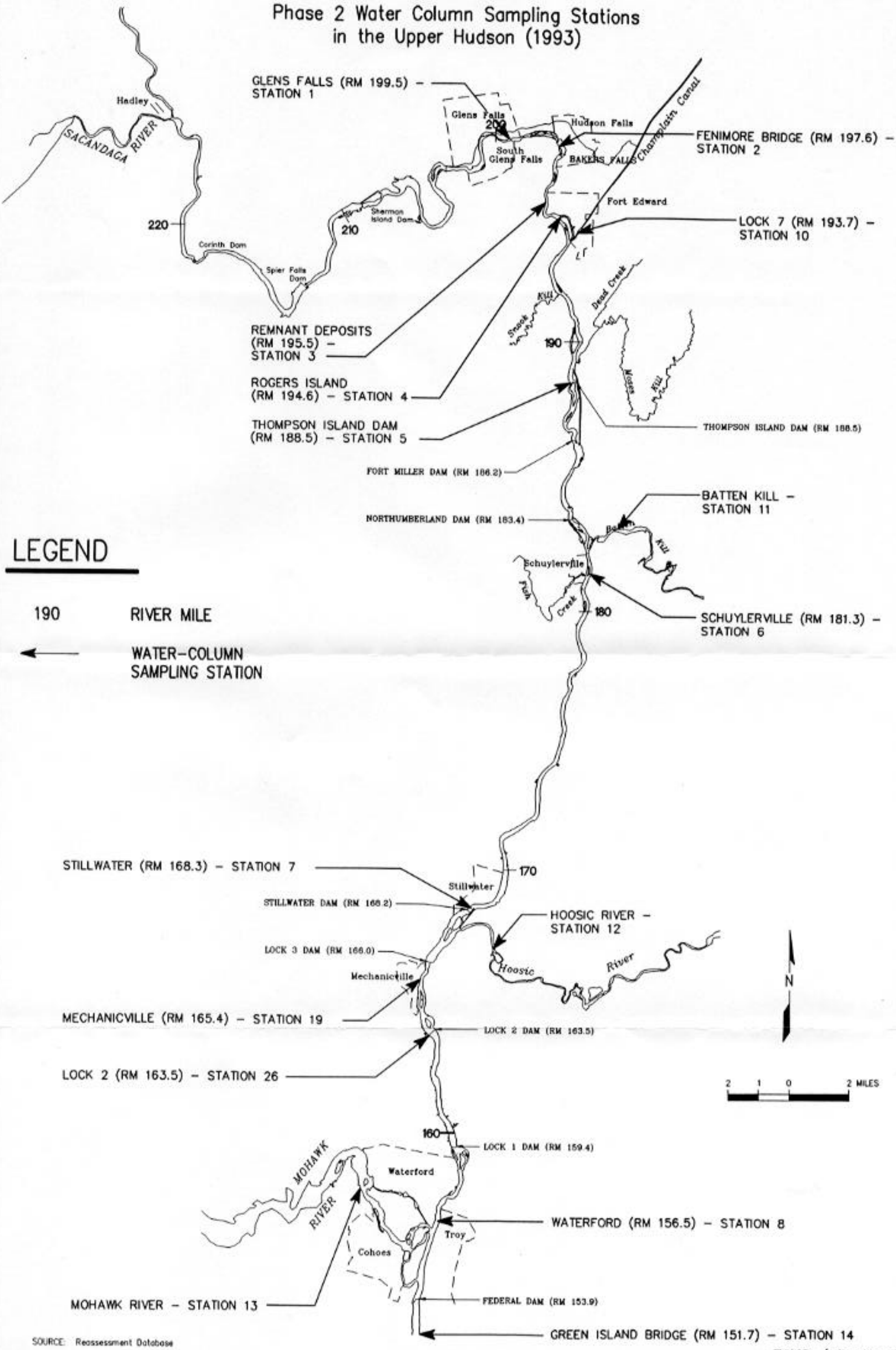
SOURCES: 1. GE, 1994.
2. Reassessment Database

TAMS / *Gradient*

File No.: 48 / Filename: FIGH8X11.dwg / Date: 8-17-95 / User: MC

File No.: 48 / Filename: FIG2-13a.dwg / Date: 2-15-95 / User: MC

Figure 2-13A
Phase 2 Water Column Sampling Stations in the Upper Hudson (1993)



LEGEND

190 RIVER MILE

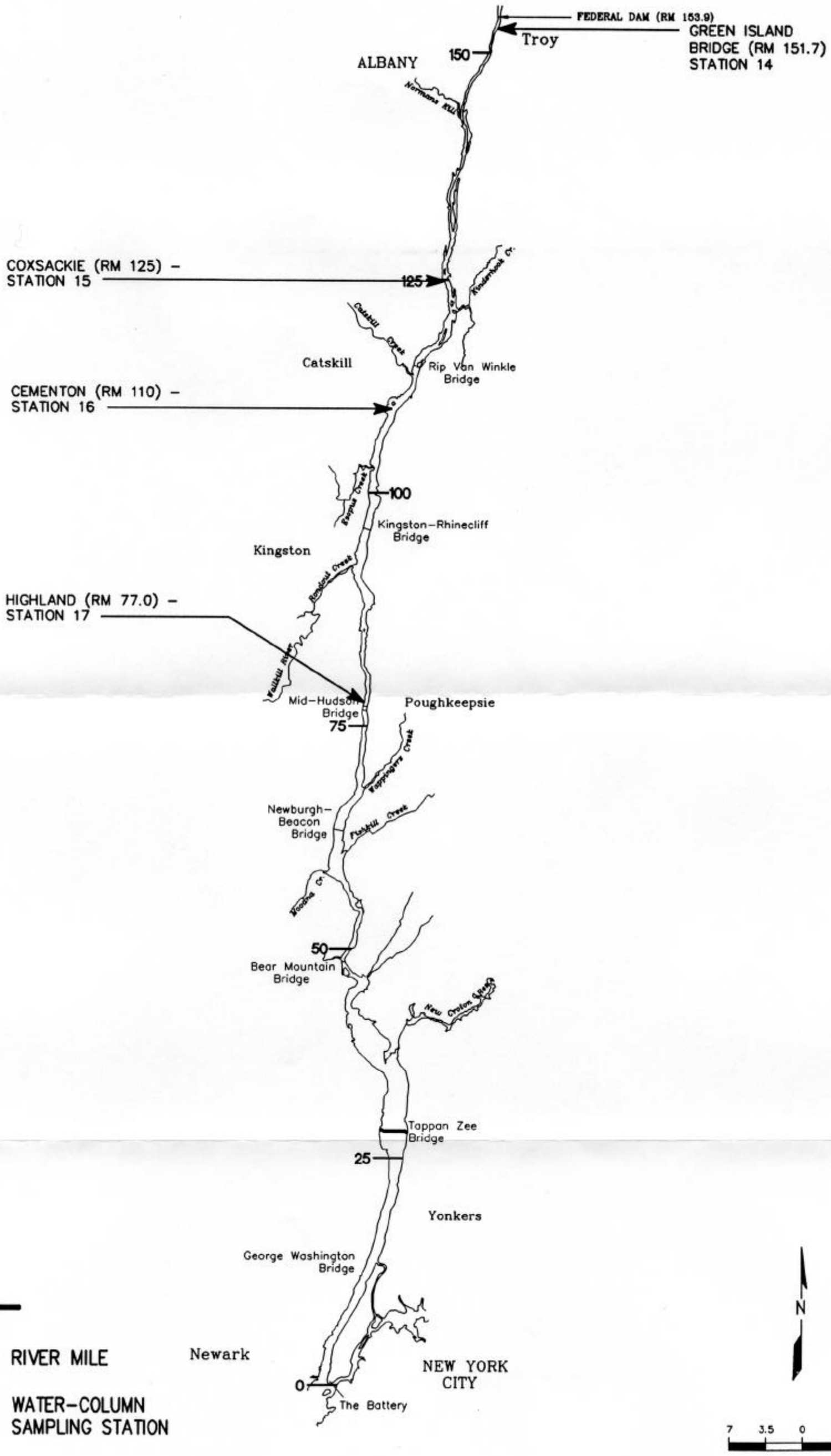
← WATER-COLUMN SAMPLING STATION

SOURCE: Reassessment Database

TAMS / *Gradient*

File No.: 48 / Filename: FIG2-13b.dwg / Date: 2-15-95 / User: MC

Figure 2-13B
Phase 2 Water Column Sampling Stations in the Lower Hudson (1993)



LEGEND

190 RIVER MILE

← WATER-COLUMN SAMPLING STATION

SOURCE: Reassessment Database

TAMS / *Gradient*

Figure 2-14
Phase 2 High Flow Suspended Solids Monitoring Stations (1994)

Hadley
SACANDAGA RIVER
Glens Falls
200
South Glens Falls
Hudson Falls
BAKERS FALLS
Champlain Canal
Fort Edward
Sherman Island Dam
210
220
Corinth Dam
Spier Falls Dam
Dead Creek
Snook Kill
190
Moses Kill
180
Schuylerville
Fish Creek
170
Stillwater
Hoosic River
Mechanicville
160
MOHAWK RIVER
Waterford
Troy
Cohoes

FENIMORE BRIDGE – STATION 2

THOMPSON ISLAND POOL AT McDONALD DOCK – STATION 25

MOSES KILL – STATION 24

ROGERS ISLAND – STATION 4

THOMPSON ISLAND POOL ABOVE SNOOK KILL – STATION 22

SNOOK KILL – STATION 23

THOMPSON ISLAND DAM – STATION 5

THOMPSON ISLAND DAM (RM 186.5)

LOCK 5 BRIDGE – STATION 20

FORT MILLER DAM (RM 186.2)

BATTEN KILL – STATION 11

NORTHUMBERLAND DAM (RM 183.4)

SCHUYLERVILLE – STATION 6

COVEVILLE – STATION 21

RIVER ROAD NEAR COVEVILLE – STATION 40

STILLWATER – STATION 7

STILLWATER DAM (RM 168.2)

HOOSIC RIVER – STATION 12

LOCK 3 DAM (RM 166.0)

MECHANICVILLE – STATION 19

LOCK 2 DAM (RM 163.5)

LOCK 1 DAM (RM 159.4)

WATERFORD – STATION 8

MOHAWK RIVER – STATION 13

FEDERAL DAM (RM 153.9)

GREEN ISLAND BRIDGE – STATION 14

LEGEND

190 RIVER MILE

← SUSPENDED SOLIDS SAMPLING STATION

N

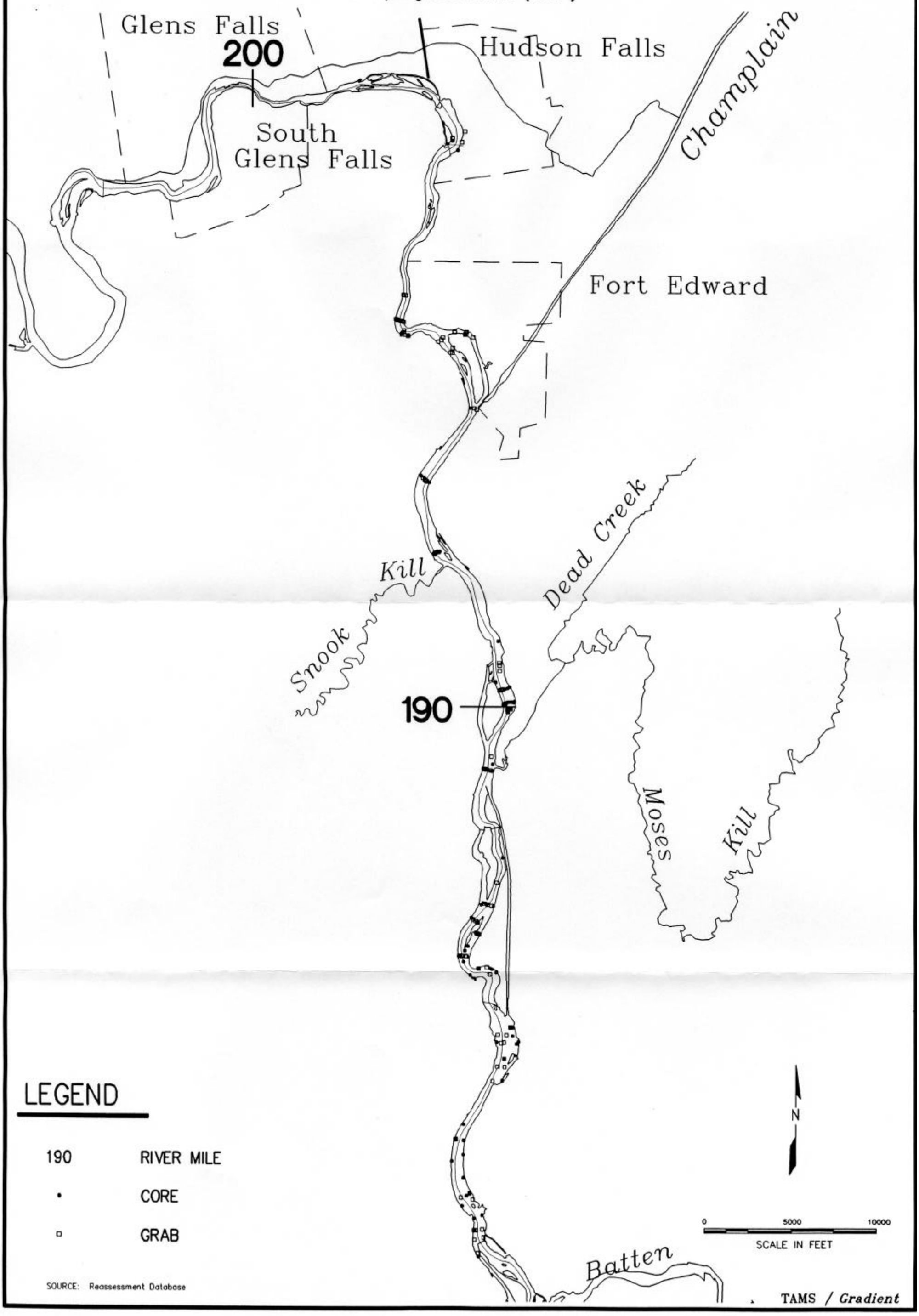
2 1 0 2 MILES

SOURCE: Reassessment Database

TAMS / *Gradient*

File No.: 48 / Filename: FIG2-15.dwg / Date: 2-15-95 / User: MC

Figure 2-15
Phase 2 Confirmatory Sediment Sampling Locations (1992)



SOURCE: Reassessment Database

TAMS / *Gradient*

Figure 2-16A
Phase 2 High Resolution Coring Sites in the Upper Hudson (1992)

Hadley
SACANDAGA RIVER
Glens Falls
200
Hudson Falls
Champlain Canal
CORE 27 (RM 202.9)
South Glens Falls
BAKERS FALLS
CORE 28 (RM 197.1)
Fort Edward
220
Sherman Island Dam
210
CORE 26 (RM 194.1E)
LOCK 7
Corinth Dam
Spier Falls Dam
Kill
Dead Creek
Snook
CORE 20 (RM 191.2)
CORE 25 (RM 194.2W)
190
CORE 23 (RM 189.3)
Mokes
Kill
CORE 19 (RM 188.5)
THOMPSON ISLAND DAM (RM 188.5)
LOCK 6
CORE 18 (RM 185.8)
FORT MILLER DAM (RM 186.2)
NORTHUMBERLAND DAM (RM 183.4)
Batten
Kill
LOCK 5
Schuylerville
Fish
Creek
180
CORE 17 (BATTEN KILL)
CORE 21 AND CORE 22 (RM 177.8)
170
Stillwater
STILLWATER DAM (RM 168.2)
LOCK 4
CORE 24 (HOOSIC RIVER)
CORE 16 (RM 166.3)
LOCK 3 DAM (RM 166.0)
Mechanicville
Hoosic
River
LOCK 2 DAM (RM 163.5)
CORE 12 (MOHAWK RIVER)
160
LOCK 1 DAM (RM 159.4)
MOHAWK
RIVER
Waterford
CORE 15 (RM 159.0)
Troy
Cohoes
FEDERAL DAM (RM 153.9)
N
2 1 0 2 MILES

LEGEND

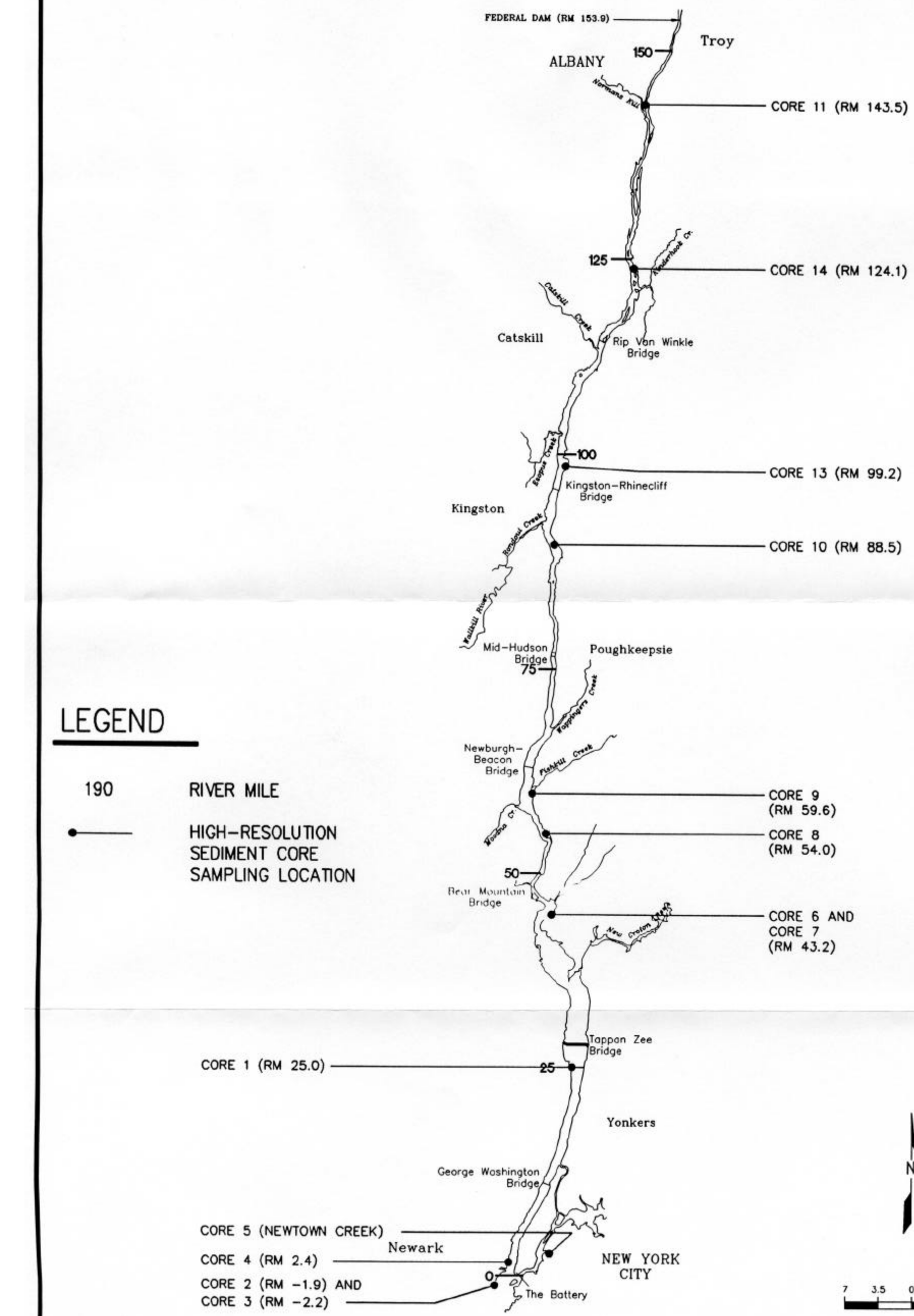
190 RIVER MILE

HIGH-RESOLUTION SEDIMENT CORE SAMPLING LOCATION

SOURCE: Reassessment Database

TAMS / *Gradient*

Figure 2-16B
Phase 2 High Resolution Coring Sites in the Lower Hudson (1992)



LEGEND

190 RIVER MILE

HIGH-RESOLUTION SEDIMENT CORE SAMPLING LOCATION

SOURCE: Reassessment Database

TAMS / *Gradient*

Figure 2-17A
Phase 2 Low Resolution Sediment Coring Locations (1994)

Fort Edward

HOT SPOT 5
HOT SPOT 6
HOT SPOT 7
HOT SPOT 8
HOT SPOT 9
HOT SPOT 10
HOT SPOT 11
HOT SPOT 12
HOT SPOT 13
HOT SPOT 14
HOT SPOT 15
HOT SPOT 16
HOT SPOT 17
HOT SPOT 18
HOT SPOT 19
HOT SPOT 20
HOT SPOT 21
HOT SPOT 22
HOT SPOT 23
HOT SPOT 24
HOT SPOT 25
HOT SPOT 26
HOT SPOT 27
HOT SPOT 28
HOT SPOT 29

Kill
Dead Creek
Snook
Moses Kill

190

LEGEND

190 RIVER MILE

• CORE

NYSDEC HOT SPOT

N

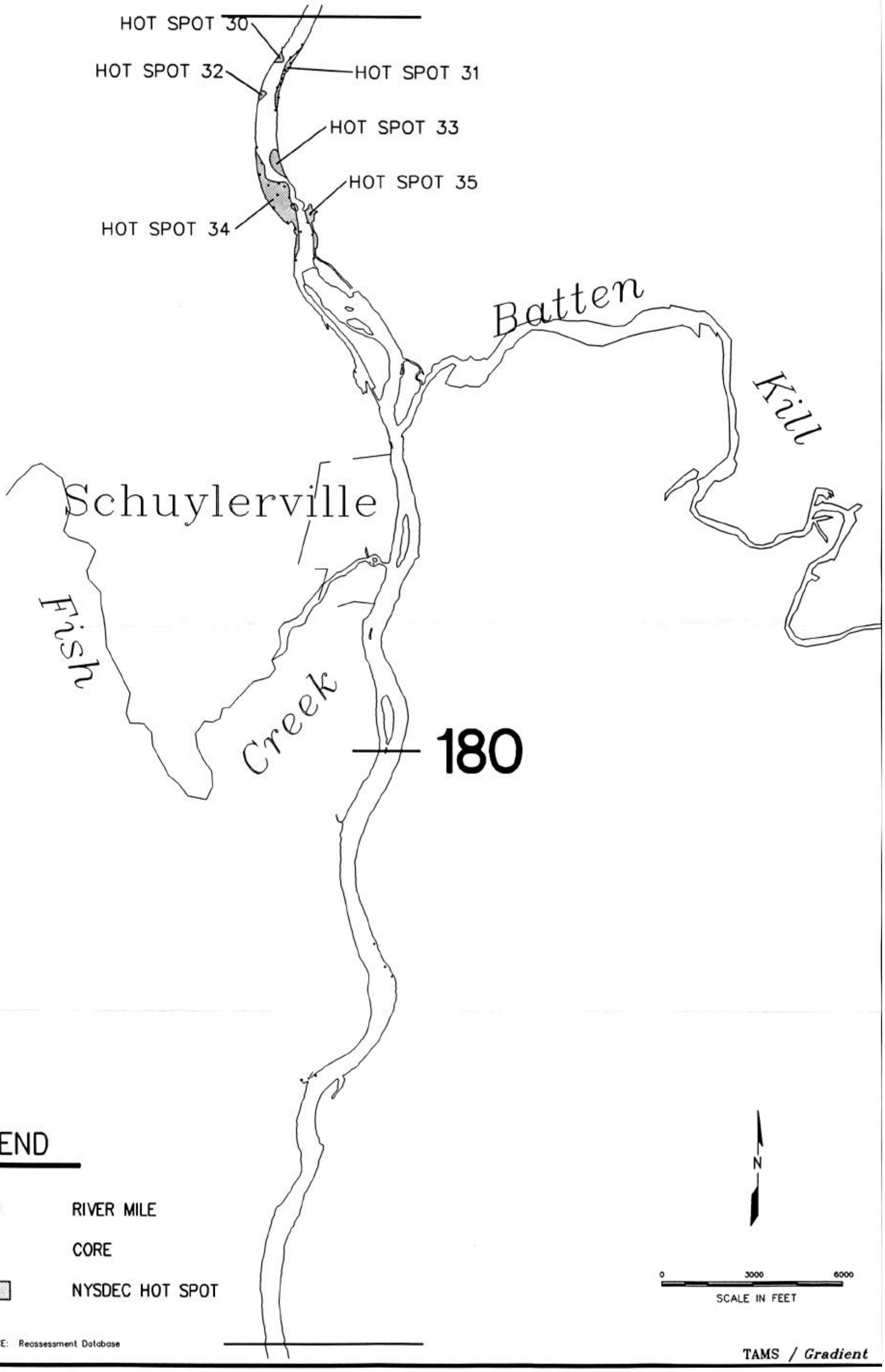
0 3000 6000
SCALE IN FEET

SOURCE: Reassessment Database

TAMS / *Gradient*

File No.: 48 / Filename: FIG2-17b.dwg / Date: 8-15-95 / User: MC

Figure 2-17B
Phase 2 Low Resolution Sediment Coring Locations (1994)

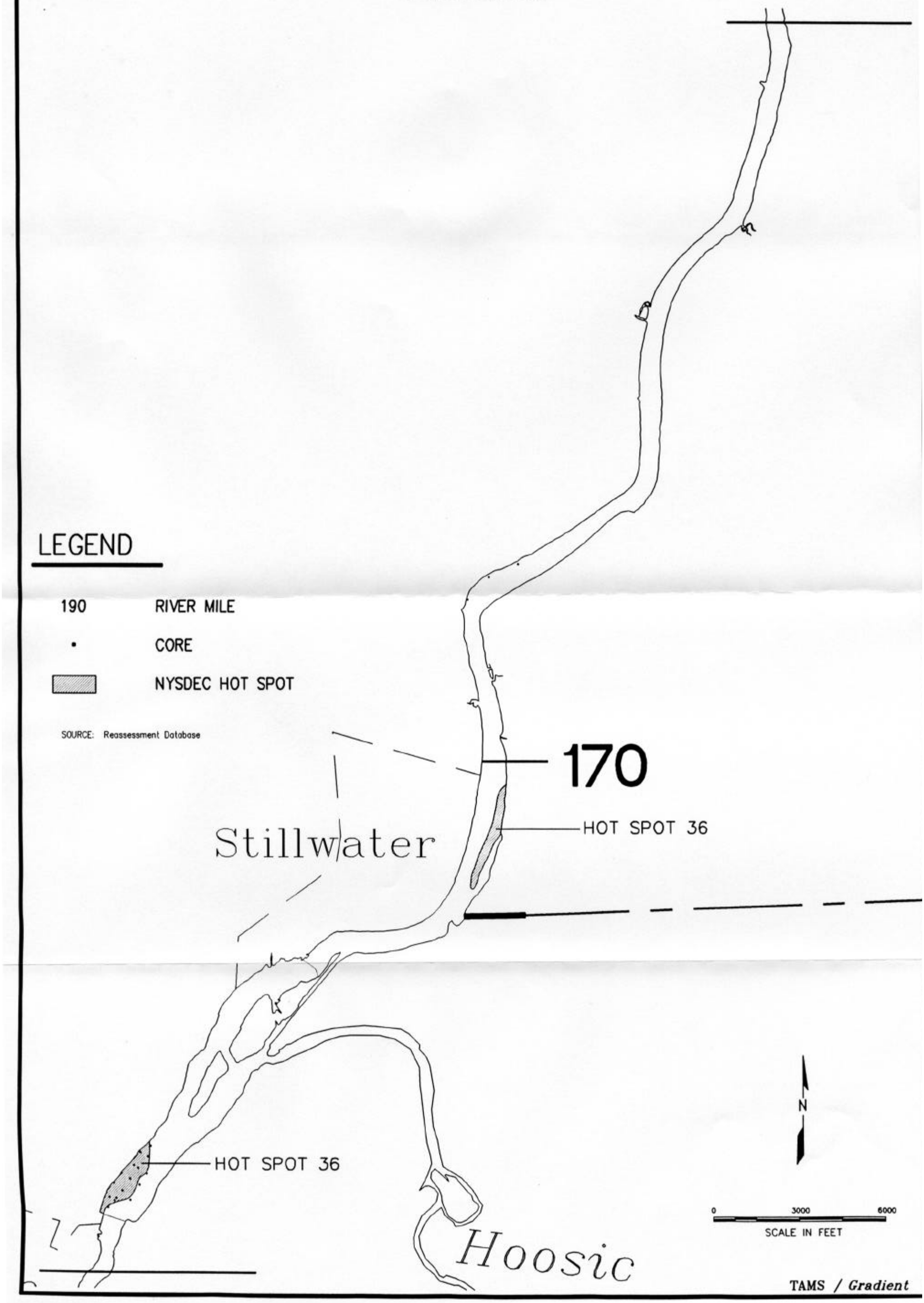


SOURCE: Reassessment Database

TAMS / *Gradient*

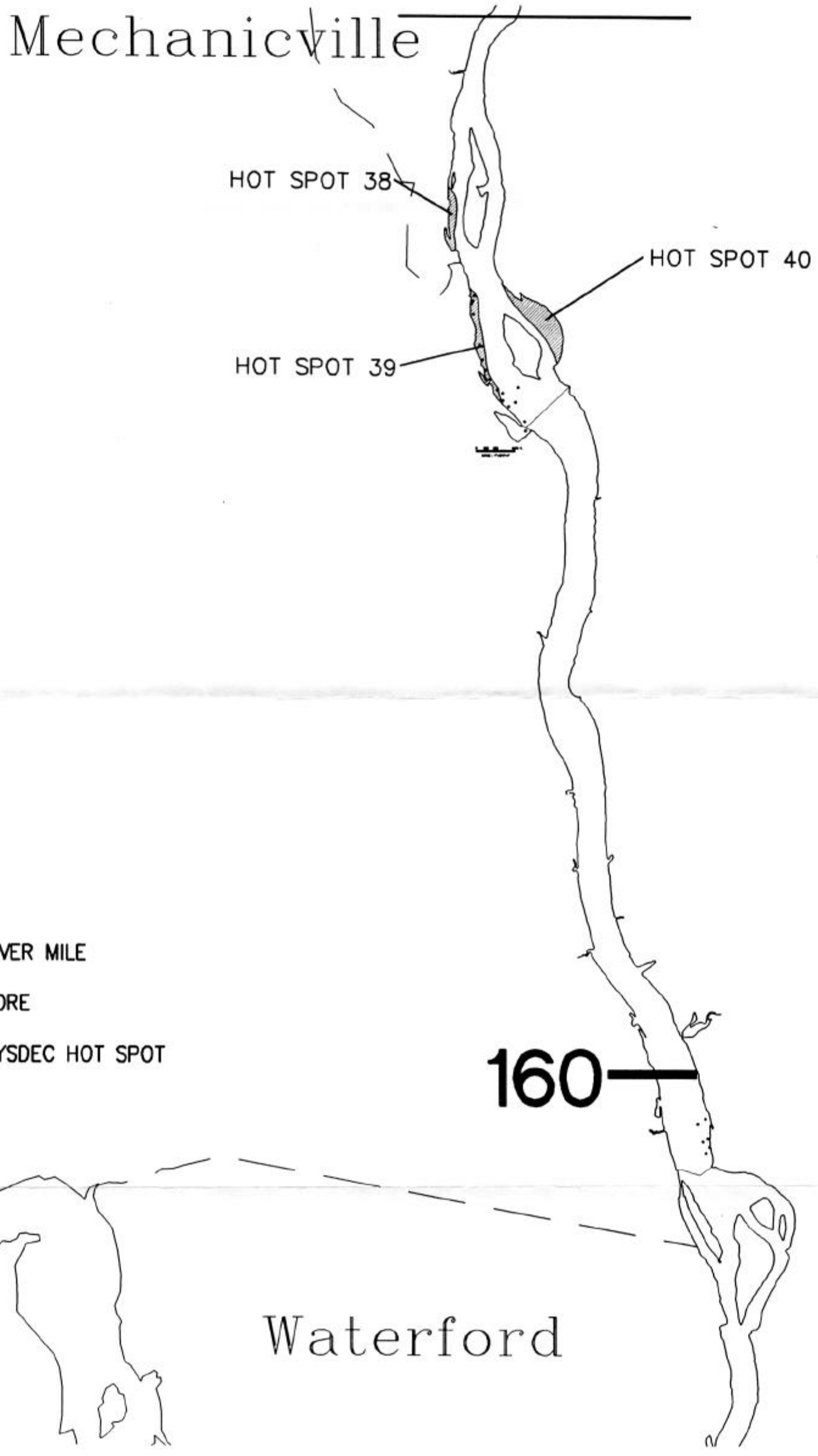
File No.: 48 / Filename: FIG2-17c.dwg / Date: 8-15-95 / User: MC

Figure 2-17C
Phase 2 Low Resolution Sediment Coring Locations (1994)



TAMS / *Gradient*

Figure 2-17D
Phase 2 Low Resolution Sediment Coring Locations (1994)



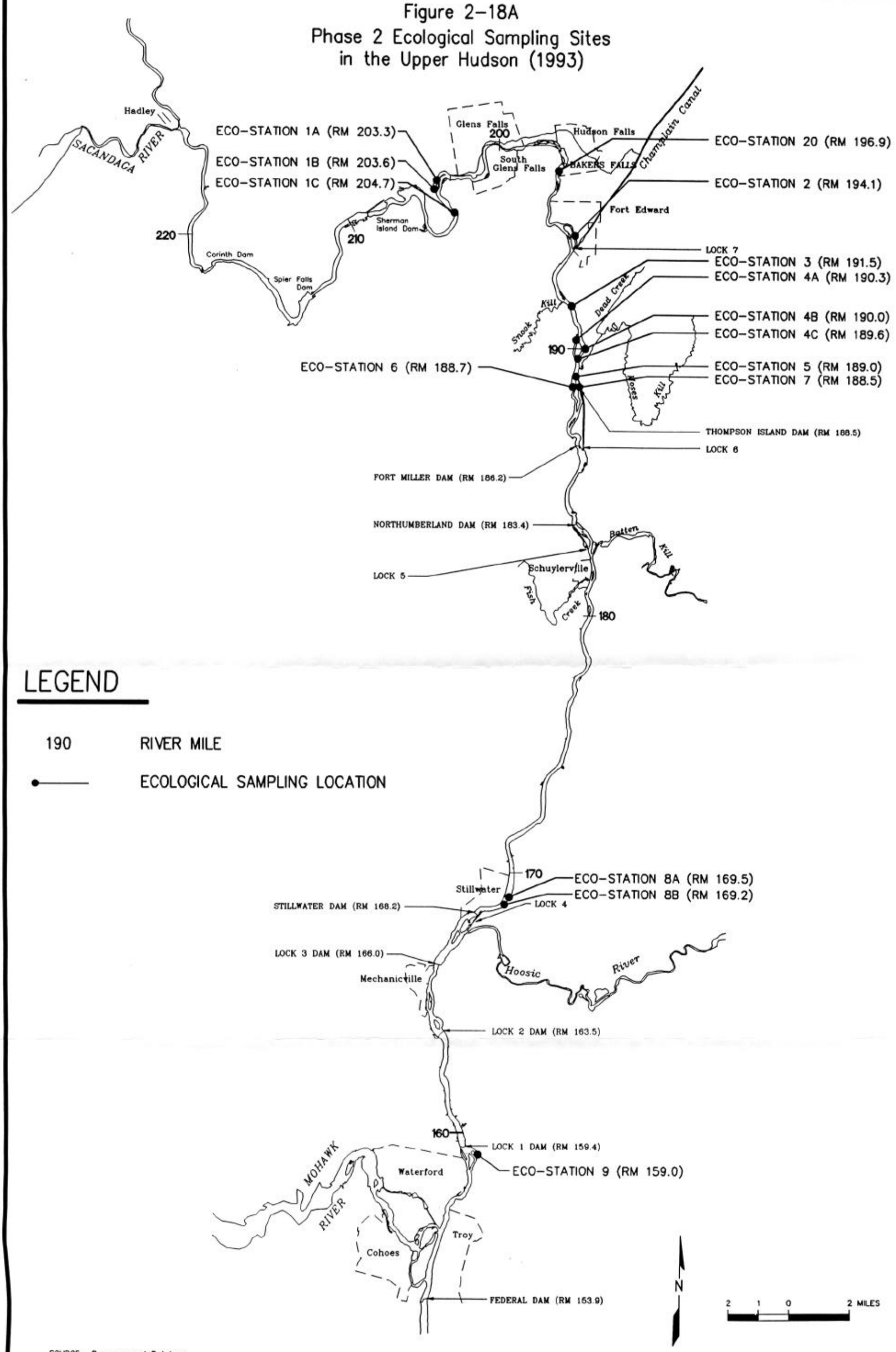
LEGEND

190	RIVER MILE
•	CORE
▨	NYSDEC HOT SPOT

SOURCE: Reassessment Database

TAMS / *Gradient*

Figure 2-18A
Phase 2 Ecological Sampling Sites in the Upper Hudson (1993)



LEGEND

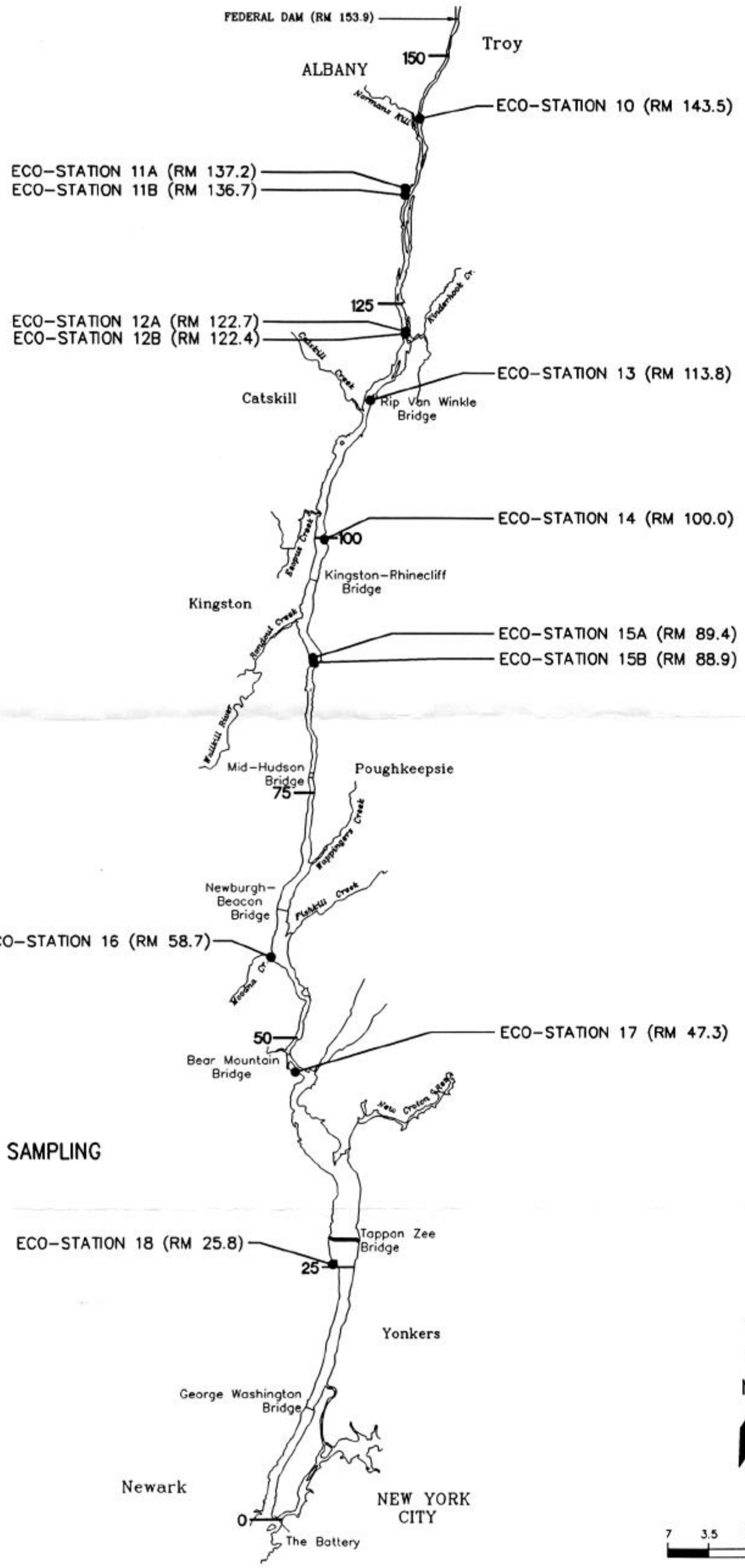
190 RIVER MILE

ECOLOGICAL SAMPLING LOCATION

SOURCE: Reassessment Database

TAMS / *Gradient*

Figure 2-18B
Phase 2 Ecological Sampling Sites in the Lower Hudson (1993)



LEGEND

190 RIVER MILE

ECOLOGICAL SAMPLING LOCATION

SOURCE: Reassessment Database

TAMS / *Gradient*

PCBS Table

TAMS ID	TAMS Type	Split	Matrix	Parameter	Units	Value 1	Value 2	Qualifier	QA Comment	Validated
HR-001-00002	P		SED	BZ#8	µg/Kg DW	9.25	9.25	J	GP	Yes
HR-001-00002	P		SED	BZ#22	µg/Kg DW	8.09	8.09	J	G	Yes
HR-001-00002	P		SED	BZ#87	µg/Kg DW	6.64	6.64	J	GHS	Yes
HR-001-00002	P		SED	BZ#180	µg/Kg DW	6.51	6.51	JN	GST	Yes

STATIONS Table

Station	TAMS ID	TAMS Type	Date Sampled	Lower Depth (cm)	Upper Depth (cm)	Est. Easting (ft)	Est. Northing (ft)	River Mile	Location	Program	SAS No.	Comments
HR-001	HR-001-0002	P	8-23-92	0	2	618700	375750	25	Piermont Marsh 12	HR	SB0618	
HR-011	HR-011-0608	P	9-30-92	8	6	654600	952700	143.5	Albany Turning Basin	HR	SB2143	
HR-027	HR-027-1216	P	9-30-92	16	12	676700	1200550	202.9	Background – Bishop's Dock	HR	SB1206	

NONPCBS Table

TAMS ID	TAMS Type	SAS No.	Split	Laboratory	SDG. No.	Parameter	Units	Value	Qualifier	Validated
HR-001-00002	P	SB0618		LDEO	19	TC	%	2.34		Yes
HR-001-00002	P	SB0618		LDEO	19	TN	%	0.2	J	Yes
HR-001-00002	P	SB0618		LDEO	19	C/N	molar	13.6		Yes

Figure 3-1
Examples of One-To Many Relationships from
PHASE2\HRCORES Database Tables

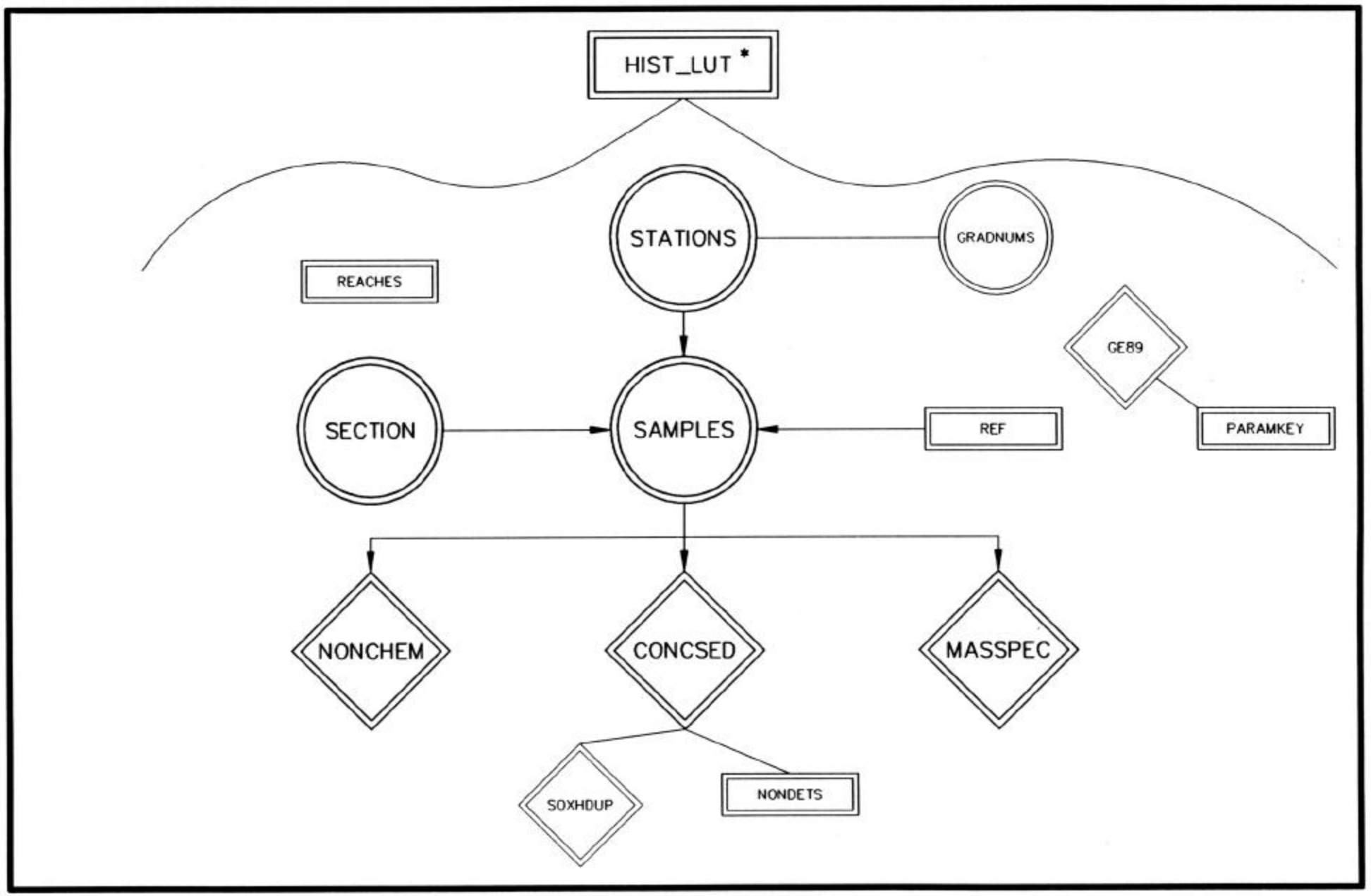


Figure 3–2
Database Tables in *HISTORIC\SED* Subdirectory

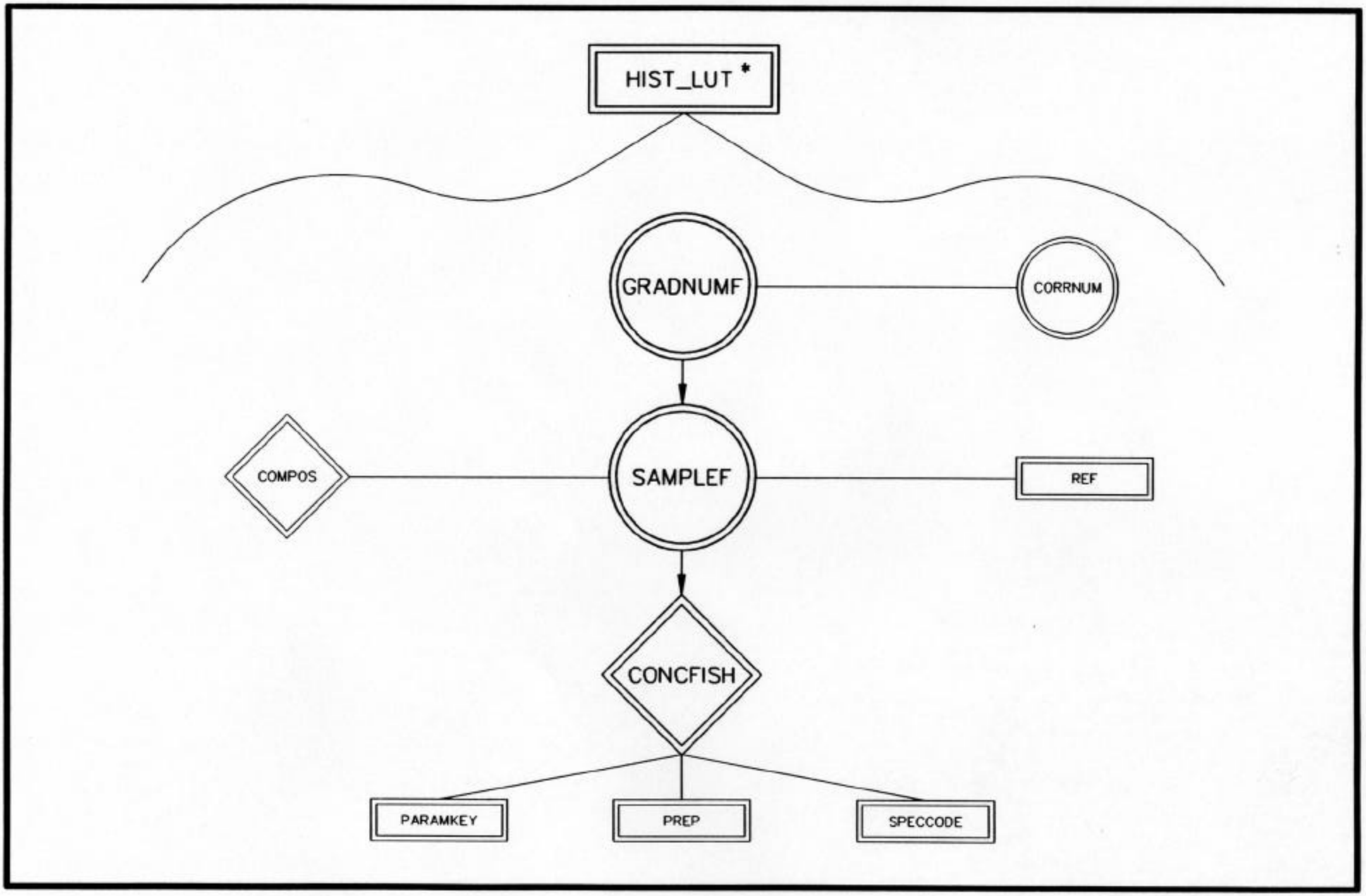


Figure 3–3
Database Tables in *HISTORIC\FISH* Subdirectory

* In HISTORIC directory – contains information on all files in this directory

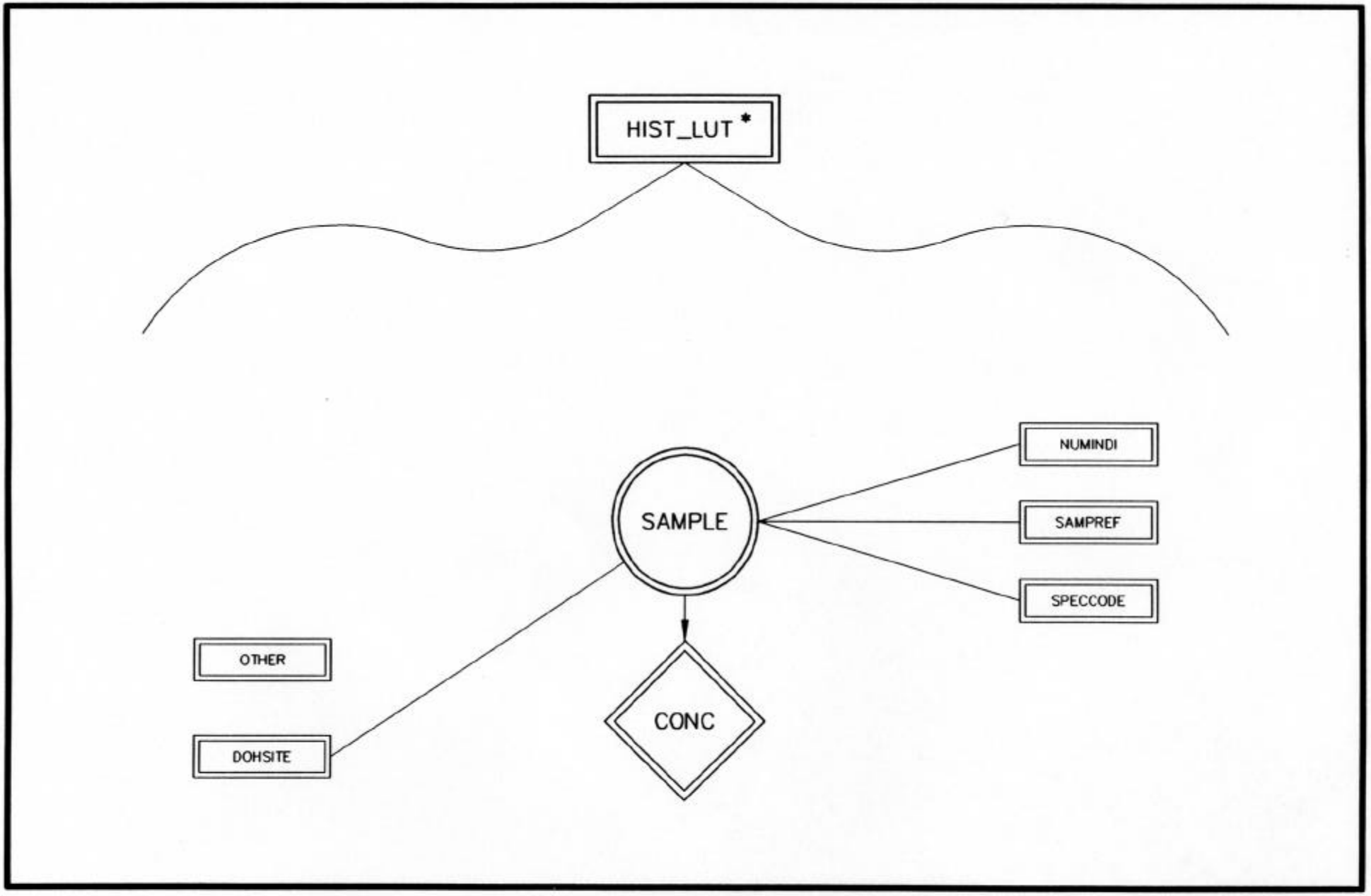


Figure 3–4
Database Tables in *HISTORIC\MACROINV* Subdirectory

* In HISTORIC directory – contains information on all files in this directory

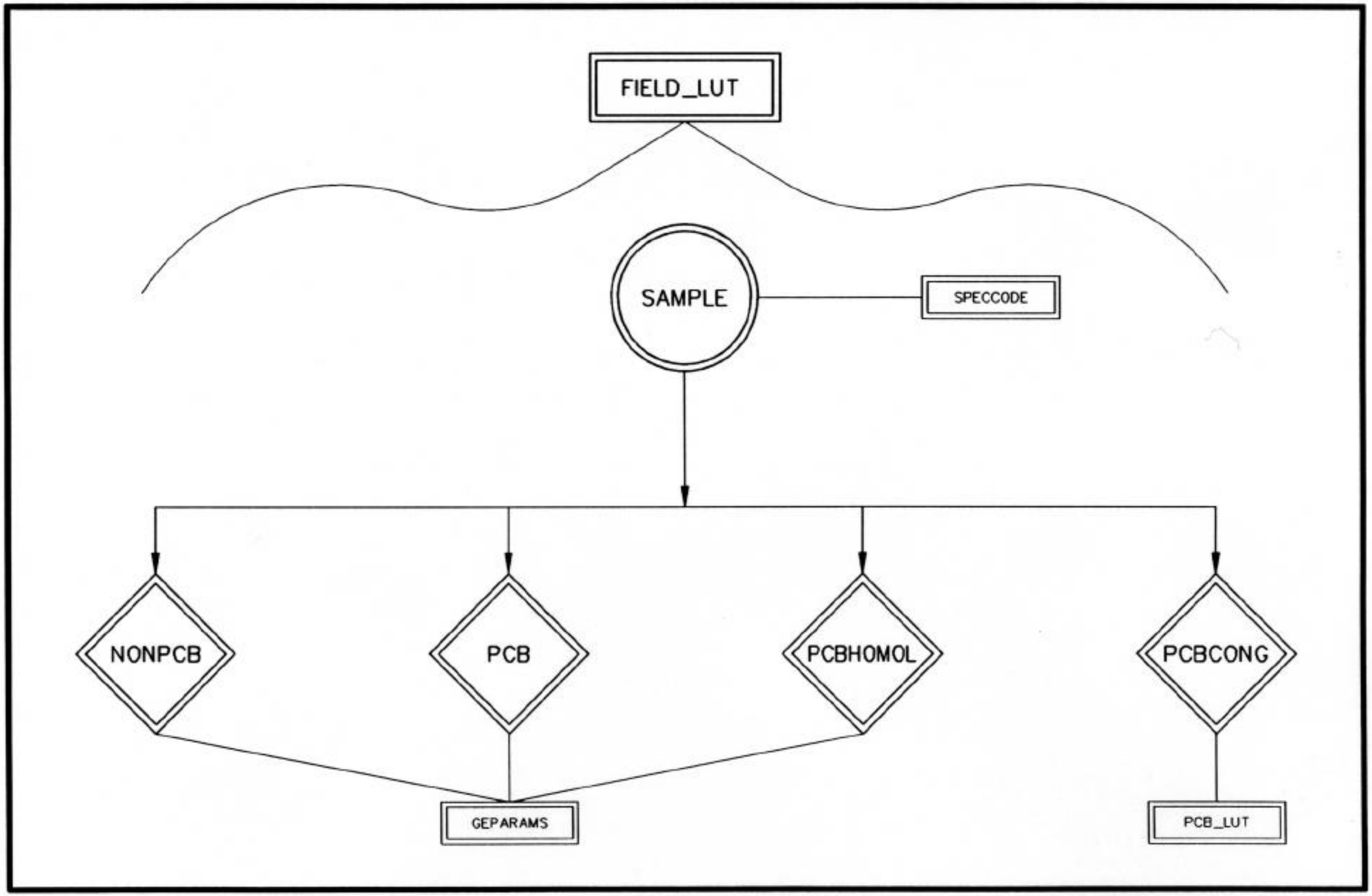


Figure 3–5
Database Tables in *GE* Directory

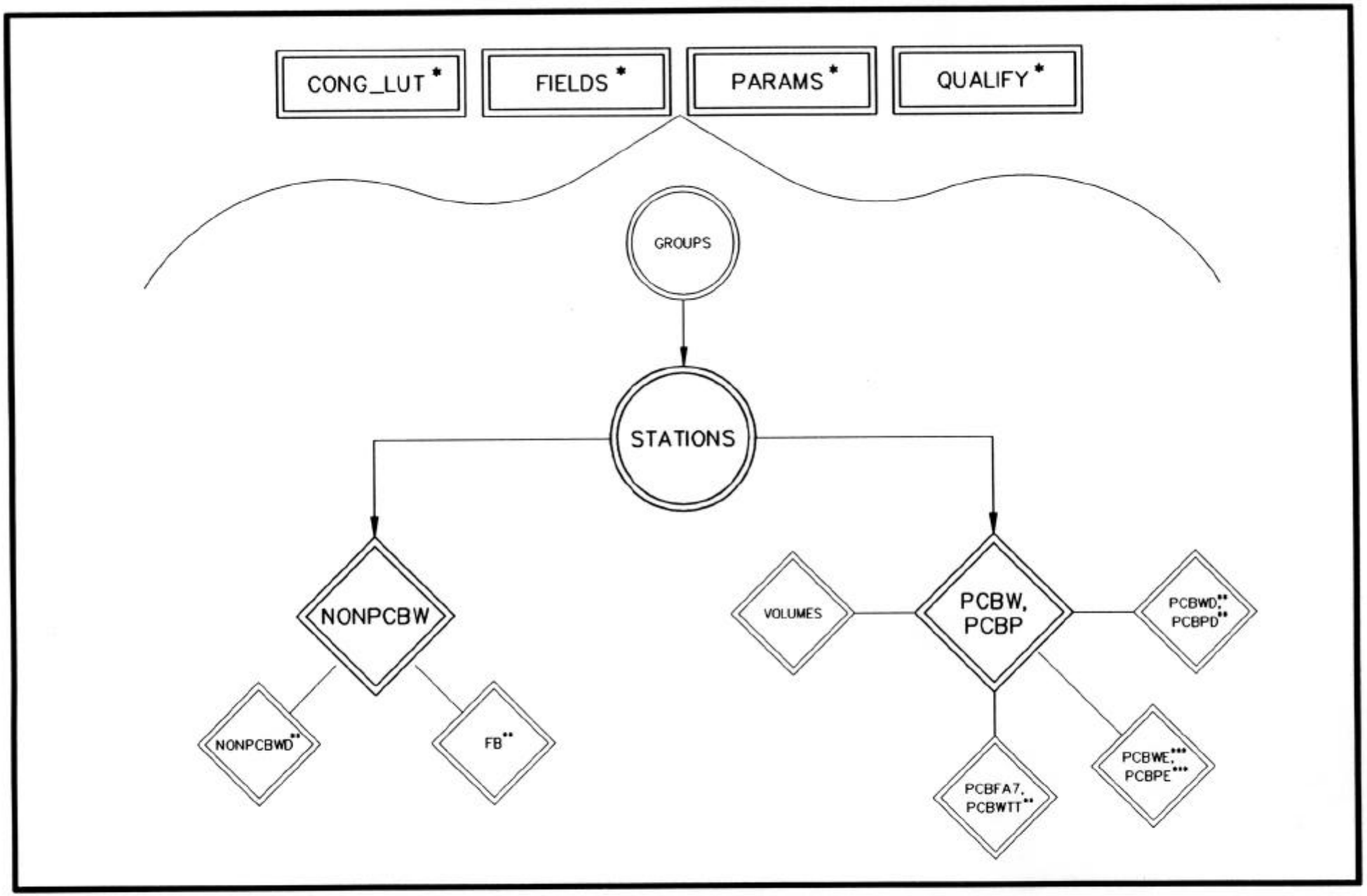


Figure 3-6

Database Tables in *PHASE2\WATER* Subdirectory

* In PHASE2 directory – reference for information on all files in this directory

** Files located in PHASE2\WATER\QA_QC subdirectory

*** Files located in PHASE2\WATER\EQUILIB subdirectory

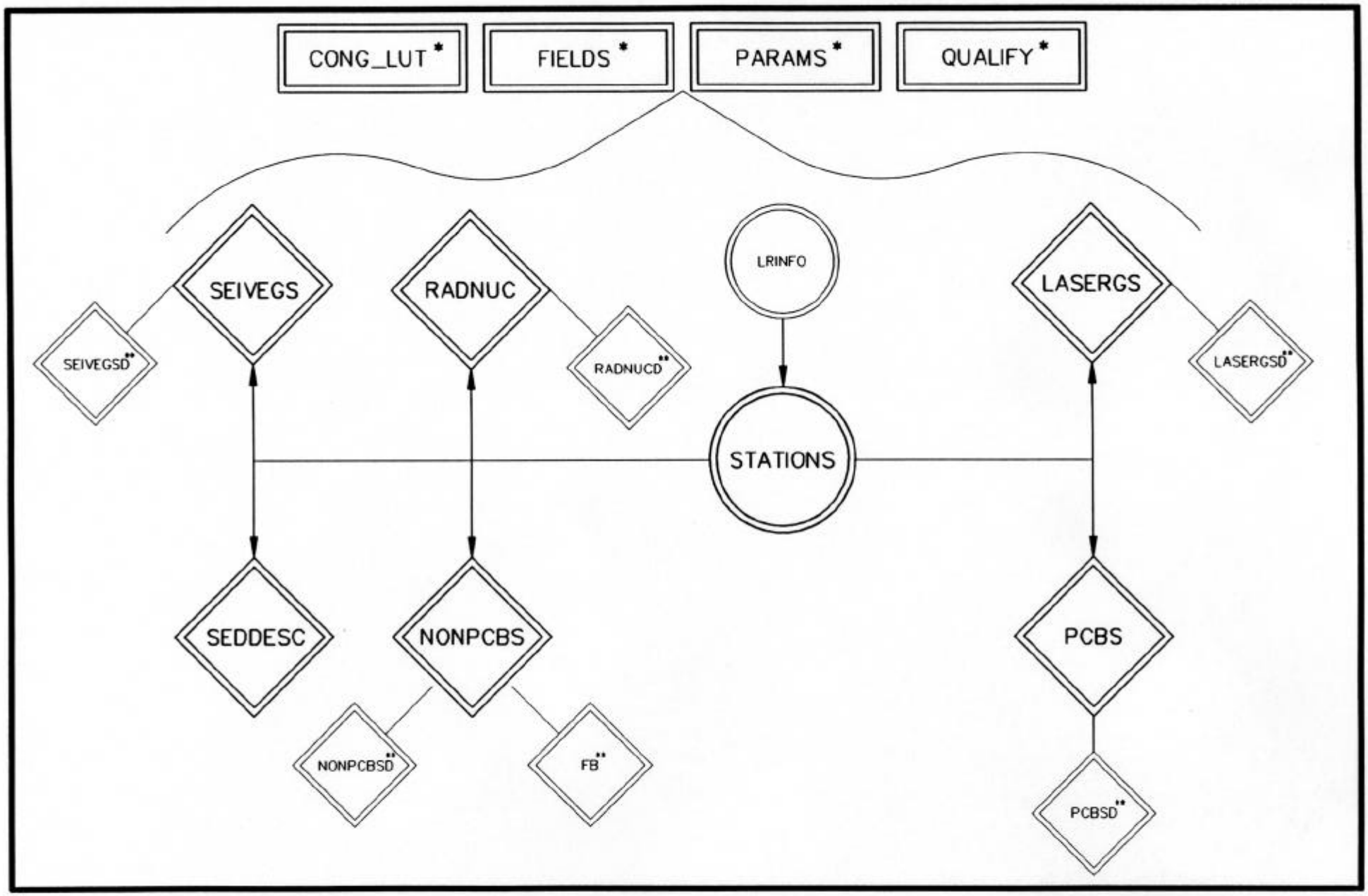


Figure 3–7
Database Tables in *PHASE2\SEDIMENT* Subdirectory

* In PHASE2 directory – reference for information on all files in this directory

** Files located in PHASE2\SEDIMENT\QA_QC subdirectory

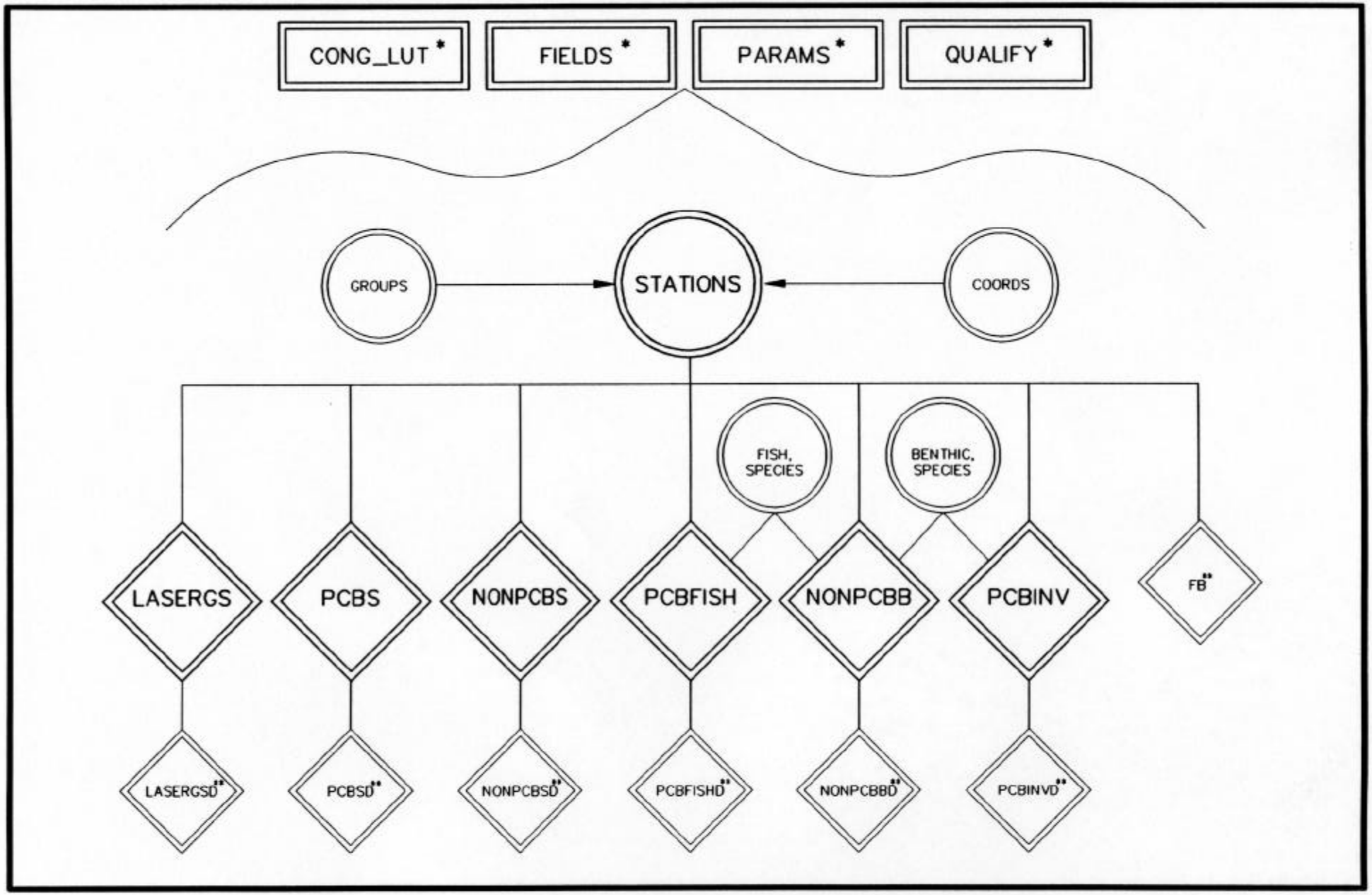


Figure 3-8
Database Tables in *PHASE2\ECO* Subdirectory

* In PHASE2 directory - reference for information ** Files located in PHASE2\ECO\QA_QC subdirectory

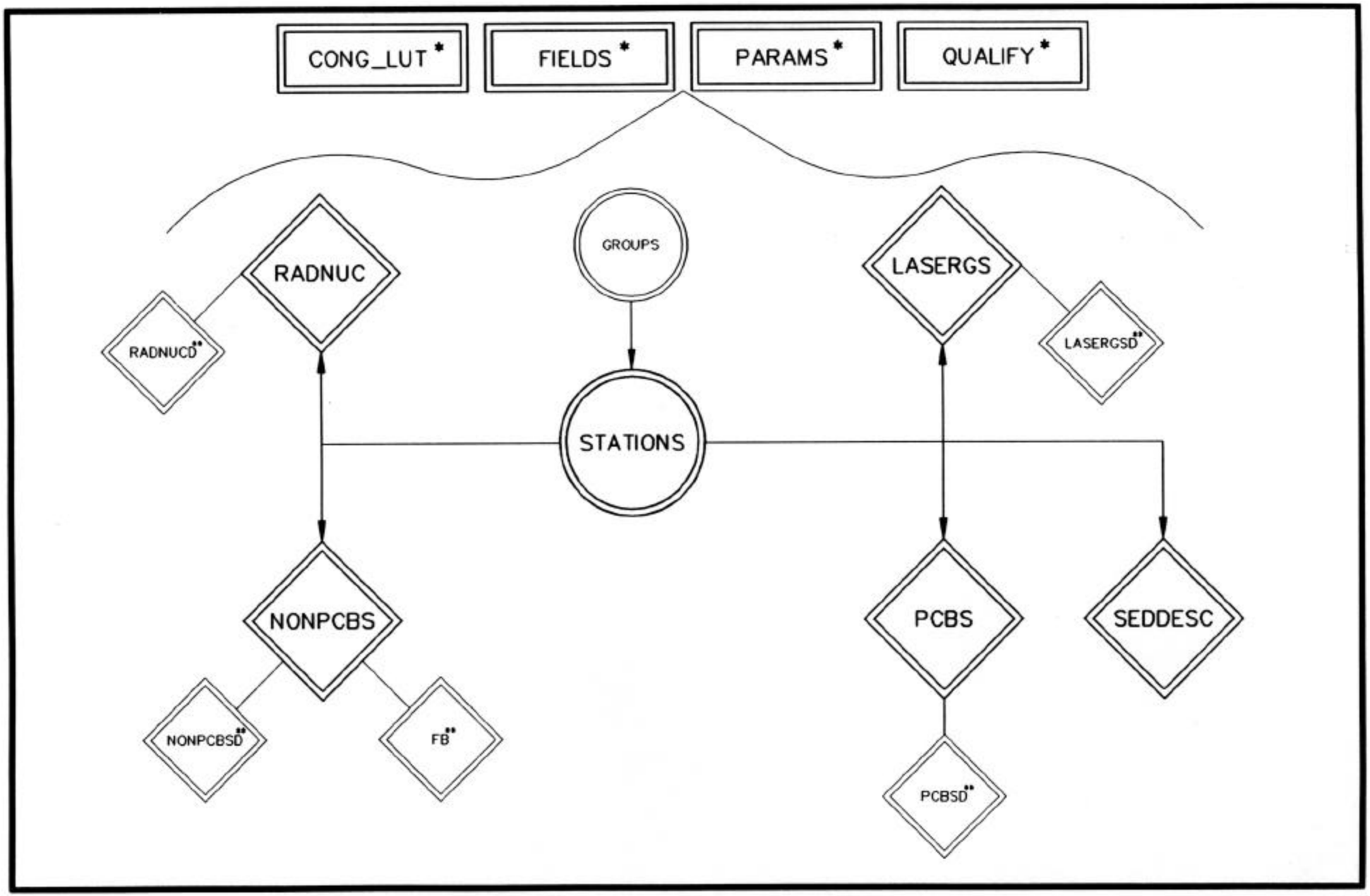


Figure 3–9
Database Tables in *PHASE2\HRCORES* Subdirectory

* In PHASE2 directory – reference for information on all files in this directory

** Files located in PHASE2\HRCORES\QA_QC subdirectory

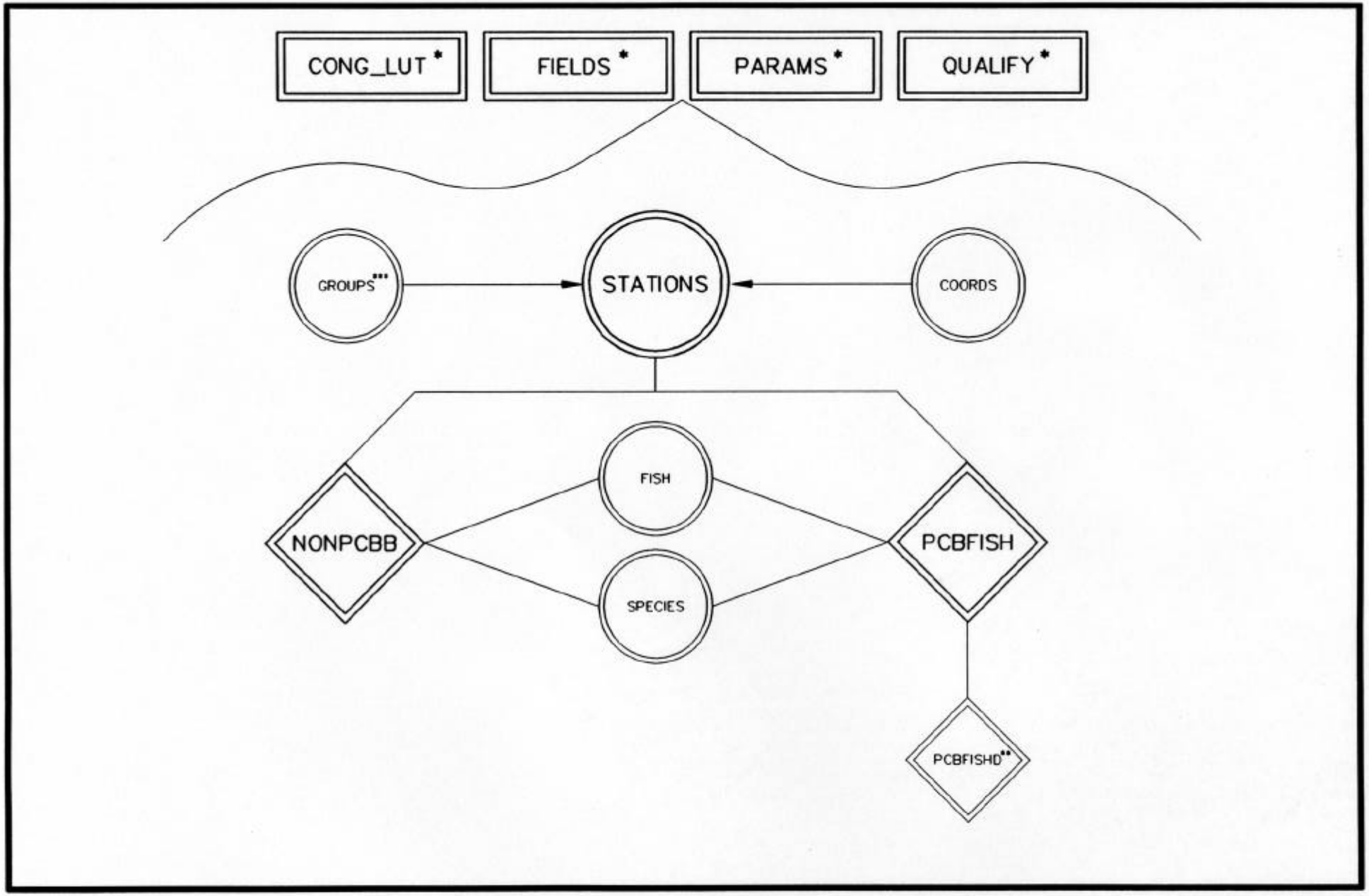


Figure 3–10
Database Tables in *NOAA* Directory

* In PHASE2 directory – reference for information on all files in this directory

** Files located in NOAA\QA_QC subdirectory

*** Files located in PHASE2\ECO subdirectory

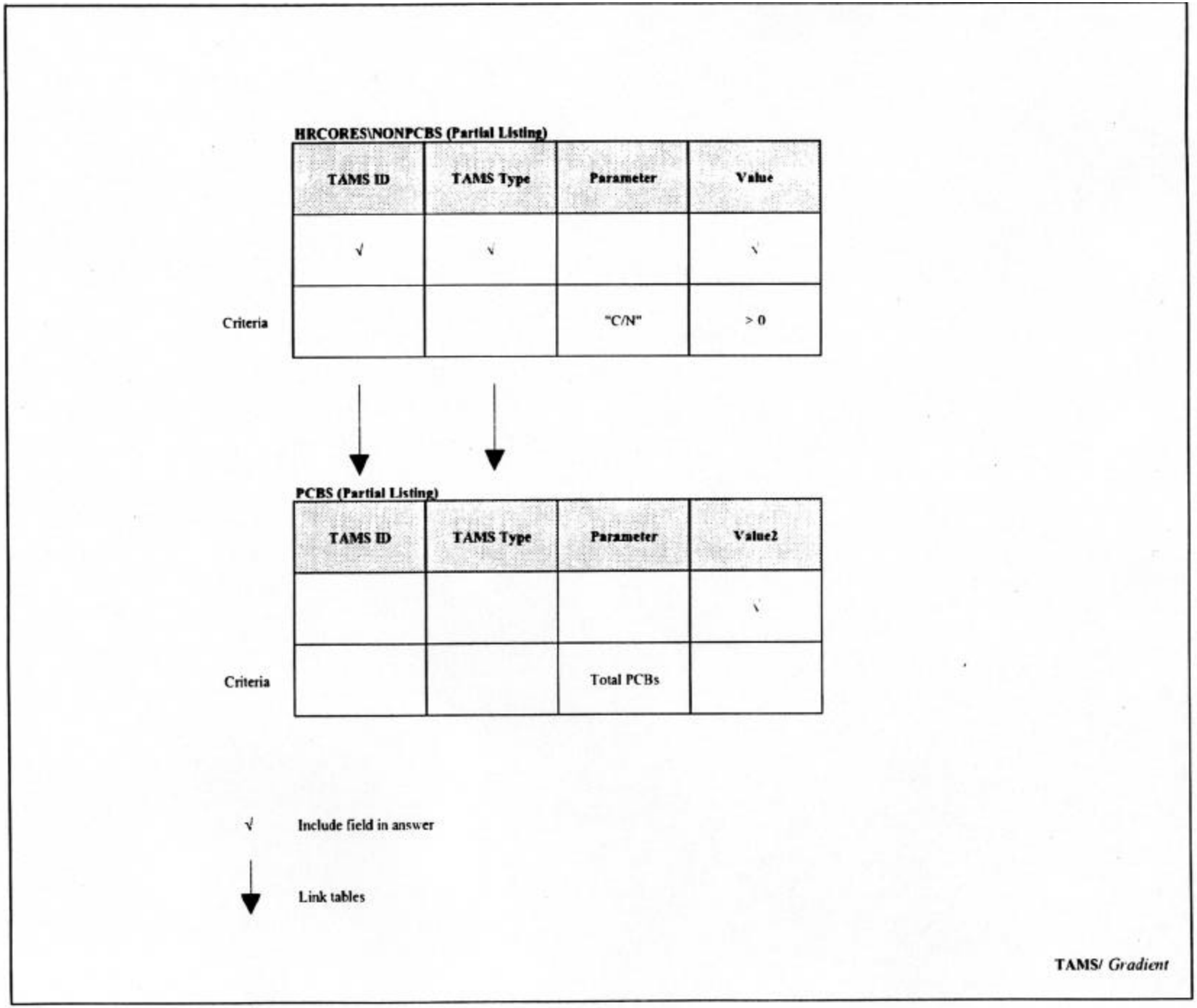


Figure 3-11
Table Links for Example Database Query 1

HRCORES\STATIONS (Partial Listing)

	Station	TAMS ID	TAMS Type	Lower Depth (cm)	Upper Depth (cm)
				√	√
Criteria	HR-019				

PCBS (Partial Listing)

	TAMS ID	TAMS Type	Parameter	Value2
				√
Criteria			Not Like BZ	

√ Include field in answer

Link tables

TAMS/ *Gradient*

Figure 3-12
Table Links for Example Database Query 2

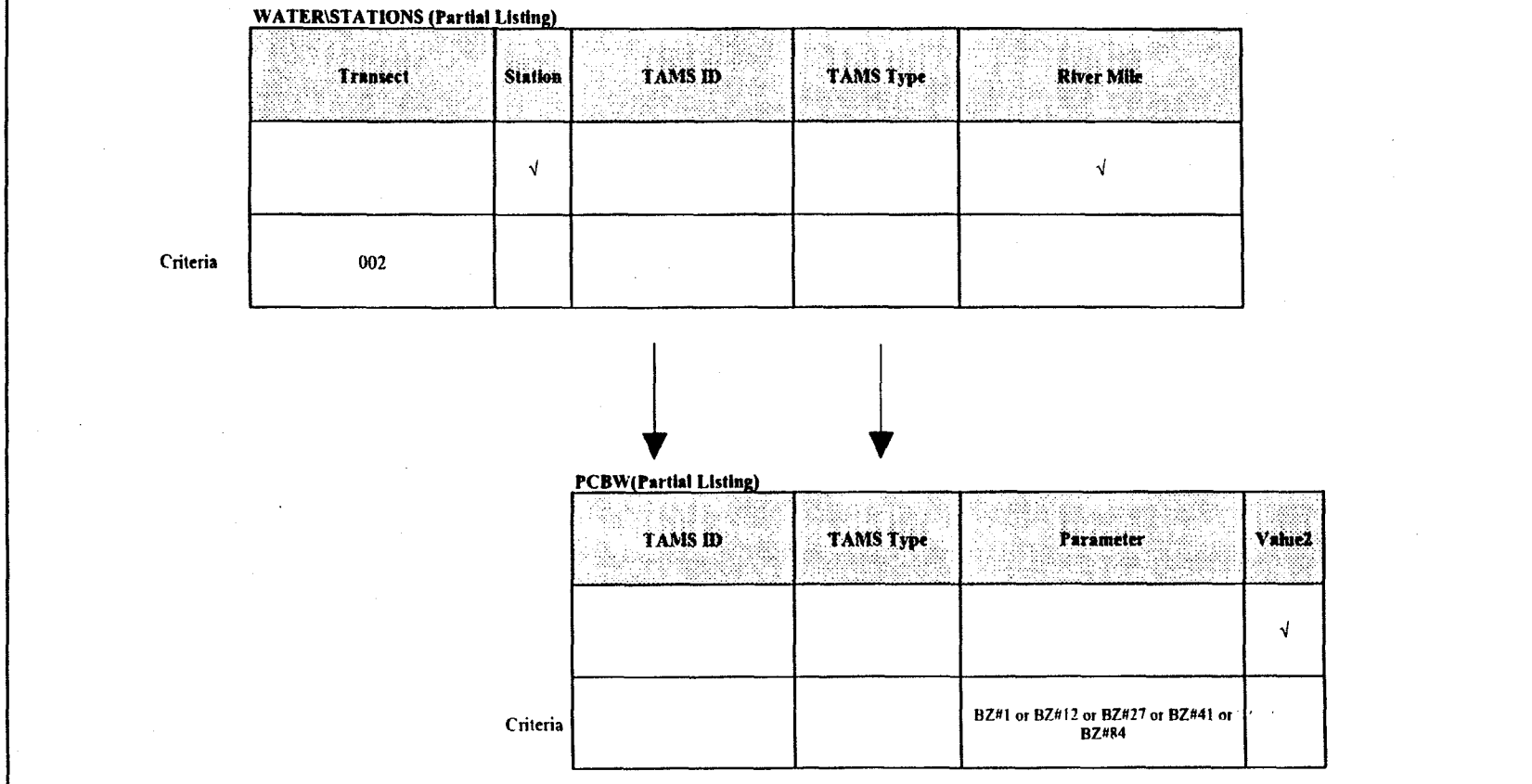


Figure 3-13
Table Links for Example Database Query 3